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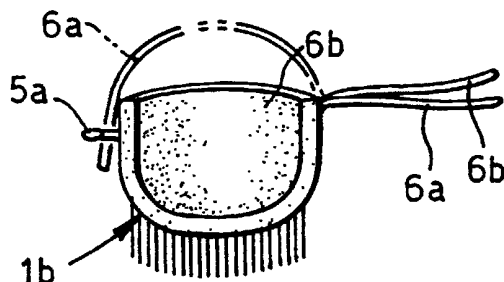
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(54) Title: IMPROVED BRUSHING DEVICE



(57) Abstract: Finger brush having a means for adjusting size to suit various finger sizes.

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IMPROVED BRUSHING DEVICE**Technical Field:**

The invention relates to a finger brush for  
5 cleaning/scrubbing surfaces having a brush body which has a  
finger-supporting side for joining the finger brush to a  
finger and another side bearing bristles and/or bundles of  
bristles on the outer surface facing away from the finger-  
supporting side. The invention particularly relates to a  
10 finger toothbrush of the type referred to above.

**Background and Prior art:**

A finger toothbrush of this type is disclosed in US 168 998  
by way of example. The finger toothbrush in that reference  
15 has a flexible brush body with bristles arranged on one  
side. Attached to the side of the brush body opposite the  
bristle side are a thimble-like holding element and a loop-  
like holding element. In manufacturing this finger  
toothbrush, the holding elements are made separately and  
20 then connected to the brush body, e.g. adhesively bonded or  
fused. This type of manufacture is, however, highly complex  
and hence costly.

A further finger toothbrush bearing bristles in a portion of  
25 a tubular brush body is known from US 5 636 405. Such a  
finger toothbrush can be manufactured in one piece, for  
example in an injection mould with two mould halves.  
However, before injecting the mould part for forming the  
interior cavity of the tube, it is necessary that a core be  
30 introduced into the mould cavity formed by the mould halves  
and be withdrawn again after injection. This is likewise

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complex and costly with regard to the injection mould and manufacture.

ZA Patent No. 2A9804872 relates to a finger brush having  
5 bristles and/or bundles of bristles on the outer side and on  
inner finger supporting side. The finger supporting side has  
one or more loop like holding element for joining the brush  
to the finger. The loop is integrally moulded and the finger  
brush is held on to the tip of a finger as a ring. The loop  
10 is of a fixed dimension and is not suitable for use for  
varying finger thickness, thus requiring to produce finger-  
brushes of varying loop sizes which is not a practical or  
feasible proposition.

15 The disadvantage of these previously known finger  
toothbrushes is that they are each suitable only for a  
single finger size. Since finger size varies from person to  
person finger toothbrushes of different sizes must be  
manufactured to suit different finger sizes.

20 Another disadvantage associated with the prior art finger  
brushes is that when they are used as finger toothbrush the  
sharp edges are likely to hit and rub against the gums and  
cause injury. A disadvantage of the brushes with polymeric  
25 bristles is that they tend to lose consistency.

The object of this invention is to provide a single design  
finger toothbrush of the type defined in the preamble which  
would be equally suitable for users such as children and  
30 adults who have different finger sizes and would also  
obviate the other disadvantages of prior art brushes.

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**Description of the Invention:**

Thus the present invention relates to a finger brush comprising:

5 a brush body having an inner and outer sides, said inner side having a finger-supporting arrangement for holding the brush to a finger of various thickness at least some point of the outer side bears bristles and/or bundle of bristles which does not come into contact with the fingers.

10

The inner side of the brush body being so shaped that in use it sits on inner side of the finger-tip with the bristles and/or bundle of bristles on the outer side of the brush body facing away from the finger side. The holding

15 attachment having one or more holding elements adapted to detachably hold the brush body in position during use.

During the use of the brush the finger moves to and fro and also radially in and out so as to brush and clean the desired surfaces corners, crevices and bends.

20

The brush body can thus be adapted to the respective finger size of a user and can be fixedly connected to a finger of any diameter with the holding elements, so that a single embodiment of the finger brush is suitable for all users.

25

Another advantage is that the finger toothbrush can be held especially well on the finger with at least two holding elements spaced a distance apart in the longitudinal extent of the brush body, and it can also be adapted to finger

30 sections of different thickness. Thus, one holding element

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may be provided on each side of the first finger joint and may be adapted according to the finger diameter there.

According to one embodiment the holding element is  
5 constituted on or more elastic holding rings which can be pushed onto the brush body so they encircle it across its longitudinal extent, and the brush body has receiving grooves with undercuts on the outside facing away from the finger rest side for insertion of the holding rings. The  
10 holding rings are dimensioned for a minimal finger diameter in the resting state and can be adapted to different finger sizes by stretching. The holding rings are held by pinching in the receiving grooves with undercuts on the brush body so they will not get lost when the finger toothbrush is not in  
15 use.

According to another embodiment the holding element constituted by two holding straps on opposite longitudinal ends of the brush body which can be detachably connected to  
20 one another in different length positions on their free end areas. The holding straps of the holding element can be joined together in accordance with the respective finger diameter. The length position of a holding element can be adjusted so that the finger brush is held securely to the  
25 finger. Preferably, the finger brush is moulded in one piece, which permits especially inexpensive mass production.

In a preferred embodiment, one holding strap of one holding element has a plurality of through-holes arranged in  
30 succession with a distance between them across the longitudinal extent of the brush body, and at least one

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holding peg projecting on the outside and having a shaft with an enlarged head is provided on the other holding strap. For detachably joining the two holding straps together, the holding peg can be passed through one through-hole depending on the desired length adjustment. A plurality of holding pegs may also be provided in succession with a distance between them according to the hole spacing of the through-holes. Depending on the desired length setting, some or all of the holding pegs and the through-holes are assigned to one another and joined together in pairs.

For a firm locking, the through-holes are designed approximately as keyholes. The holding pegs may be passed with their enlarged heads through an enlarged insertion area of a through-hole. This simplifies joining the two holding straps together and makes it possible to prevent damage due to frequent connecting and releasing of the holding straps. If the holding straps have adequate elasticity, a single length adjustment to a user's finger and connection of the holding straps in this position will be sufficient. After this preliminary adjustment, the finger brush may also be placed on the finger or pulled off without opening and closing the holding straps.

According to another embodiment, the brush body has an aperture in the area of each holding element, and an approximately loop-like holding element made of elastic material in particular acts on at least one of the opposing bordering edges extending along the finger t-brush. The apertures permit simple, one-piece manufacture of the finger t-brush in an injection mould. The loop-like holding

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elements may be designed as a closed loop, thus simplifying handling of the finger toothbrushes. The holding elements are adapted to the respective finger size of a user by elastic deformation of the holding elements. Furthermore, curvature of the brush body in brushing to adapt to the shape of the surface claimed, is facilitated by the apertures. The flexibility of the finger toothbrushes is thereby increased and the tooth brushing results can be improved.

10

It is advantageous if the holding elements are each made of a material, especially rubber or a rubbery material, with a greater elasticity in comparison with the material of the brush body. The brush body may be designed to be comparatively rigid as the carrier of the bristles and/or bristle bundles. The increased elasticity of the holding elements permits adaptation of different finger sizes. Such a finger toothbrush can be manufactured in an injection mold having a separate injection nozzle for each of the different materials. Materials of different colours may be used for the brush body and the holding elements, thereby improving the appearance of the finished finger brushes. To achieve the intended deformability, the holding elements may also be designed narrow and/or thin.

25

It is advantageous if the brush body, is shaped approximately up to or over the tip of the finger at least in the area of the end accommodating the fingertip.

Therefore, inner position of the finger tip is covered by the brush body and the fingernail is surrounded by the edges of the brush body in a manner that the fingernail or its

30

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outside finger edge is practically embedded in the curved brush body. This prevents injuries in the oral cavity, when the brush is used as a toothbrush.

5 It is advantageous if the brush body has ridge-like projections and/or through-like recesses. The through-like recesses act like suction cups, which can improve a finger's hold on the finger t-brush. Projections can also prevent slippage of the finger t-brushes on the finger during use.

10

It is also possible for the projections on the finger rest side of the brush body to be designed as barbs. When brushing, the finger is pressed against the finger rest side of the brush body, and inadvertent slippage of the finger t-  
15 brush from the finger is prevented by the barb-like projections. The barb-like projections are preferably aligned in such a way as to make it difficult for the finger to slip out of the finger brush, because a stop is usually provided at the front end.

20

In an embodiment with holding straps that can be joined together by holding pegs and through-holes, the length position can be adjusted only in steps corresponding to the hole spacing of the through-holes.

25

An advantageous embodiment according to this invention provides for the holding elements to be adjustable in length in different holding steps, and for the holding steps of the holding element facing the fingertip of two adjacent holding  
30 elements to be arranged opposite the holding element facing away from the fingertip for adjustment to smaller finger



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diameters and/or for said holding steps to have a smaller step spacing. This embodiment makes it possible for the front holding element facing the fingertip to lie more tightly on the finger, because fingers are thinner in the area of the fingertips. Therefore, the through-holes provided on the holding straps and/or the holding pegs on the front holding element may be shifted by half a space in comparison with the rear holding element. If the holding steps on the adjacent holding elements are arranged on approximately the same level, however it is also possible to set the front holding element at the narrowest / tightest holding step, while the rear holding element is set at the next larger holding step or the one after that, but the difference in diameter in the longitudinal direction of the finger is usually smaller than the spacing between the different holding steps provided on the holding elements.

The bristles may have varying configuration. Two separate bristles each tapering at one side toward its free end may be provided, thus enhancing the cleansing action of the bristles. In addition, the free ends of the bristles may be rounded to prevent injury in the oral cavity when cleaning teeth.

The cleaning end of the bristle may be divided into a plurality of bristle tips. The bristle tips are so narrow as to enable thorough cleaning of the teeth and particularly of the inter-dental spaces. The free extremities of the bristle ends are also rounded to prevent injury.

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The bristle tips may differ in length. The entire array of bristles of the finger brush can thus be contoured to enhance the cleansing action. Furthermore, the bristle tips may be re-divided into fine end portions. An especially fine  
5 surface, with which the teeth can be cleaned especially thoroughly, is thus achieved.

Slanting bristles may be provided in the area of the front and longitudinal sides of the finger brush. Teeth can  
10 thereby be cleaned in a simpler and more thorough fashion. Since the bristles consist of elastic material, the slanting bristles can also be detached from the mould without any difficulty after the finger brush has been injection  
moulded.

15 The finger brushes can be made in different sizes, e.g. larger ones for adults and smaller ones for children. Furthermore, finger brushes can be made with bristles of different hardness. The finger brushes can be fashioned in  
20 different colours to distinguish ones of different size and/or bristle hardness.

The finger brush according to the invention is particularly suited for use as a finger toothbrush. Embodiments of the  
25 finger toothbrush according to this invention are described below with reference to drawing.

Figures 1 & 1A shows side and top views of one embodiment of a finger brush according to the invention referred to as  
30 broken ring model.

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Figures 2 & 2A shows side and top views of a second embodiment of a finger brush according to the invention referred to as broken start whole arrangement.

5    Figures 3 & 3A shows side and top views of a third embodiment of a finger brush according to the invention referred to as stud hole arrangement.

10   Figures 4 & 4A shows side and top views of a fourth embodiment of a finger brush according to the invention referred to as cross over strap model.

15   Figures 5 & 5A shows side and top views of a fifth embodiment of a finger brush according to the invention referred to alternative cross over strap model.

Figure 6 shows an enlarged view of a typical hole arrangement in the strap.

20   Figures 7 & 7A shows a typical bristle lay out in a brush.

Figure 8 shows finger brush according to the invention referred to thimble model.

25   The broken ring model of Figs. 1 & 1A has a brush body 1 having a finger-supporting side A and a bristle supporting side B, the finger supporting side has two pairs of generally loop-like holding elements 3a and 3b for joining the finger brush to a finger. On the bristle supporting  
30   side B the brush body 1 bears bristles 4. Such a finger brush can be slipped onto a finger and employed for cleaning

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teeth or surfaces directly with the finger. The holding elements 3a and 3b are resilient and in use firmly hold the finger preventing the brush being disengaged from the finger. The holding elements 3a have dimensions to hold the tip side of the finger while the holding means 3b have a relatively larger passage to hold the thicker side of the finger. The resilience of the holding means 3a, 3b allow the brush to be used for varying finger sizes. The finger brushes can be manufactured in one piece and in an injection mould.

The broken ring model of Fig. 1 has a brush body 1 having a finger-supporting side A and a bristle supporting side B, the finger supporting side has two pairs of generally loop-like holding elements 3a and 3b for joining the finger brush to a finger. On the bristle supporting side B the brush body 1 bears bristles 4. Such a finger brush can be slipped onto a finger and employed for cleaning teeth or surfaces directly with the finger. The holding elements 3a and 3b are resilient and in use firmly hold the finger preventing the brush being disengaged from the finger. The holding elements 3a have dimensions to hold the tip side of the finger while the holding means 3b have a relatively larger passage to hold the thicker side of the finger. The resilience of the holding means 3a, 3b allow the brush to be used for varying finger sizes. The finger brushes can be manufactured in one piece and in an injection mould. Due to adjustable nature of the holding elements 3a, 3b it is not necessary to manufacture finger brushes of different sizes. If desired, larger finger brushes with a larger brush body can be provided for adults and smaller ones with a smaller

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brush body can be provided for children. These can be then  
be used by anyone in the respective group of persons,  
regardless of the individual finger size. The holding  
elements are made of a slightly hard material which may be  
5 compensated by small dia of bristles. Since fitting of  
finger brush will be one hand operation, it is advantageous  
to keep it as simple as possible.

In figs. 2 & 2A studs 5a, 5b are fixed on the body. This  
10 stud can be engaged with proper hole 7 in counter strap 6a,  
6b.

According to the embodiment of Figs. 3 & 3A instead of two  
small single straps with holes, one may use a single broader  
15 strap 8 with holes 9. Studs 10a, 10b, 10c are provided for  
locking the straps by the use of the holes 9.

The embodiment of Figs. 4 & 4A envisages two strap  
arrangement with opposite straps 11a, 11b having either  
20 holes 12 or studs 13a, 13b. The front strap 11a with hole 12  
is engaged with stud strap 13b on the rear portion, thereby  
providing cross over arrangement. Such arrangement would  
hold the finger properly.

25 In the embodiment of figs. 5 & 5A instead of having studded  
strap, studs 14a, 14b are provided on brush body which can  
be engaged with opposite straps 15a, 15b with holes 16 in a  
manner similar to that in Fig. 4 to obtain cross over.

30 In the embodiment of fig. 6 instead of having finite numbers  
of discrete holes, a slightly broader belt 17 with many

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small holes 18 connected to each other by a slit 19 is provided. This arrangement would be a kind of continuous hole.

5 The end bristles of the brush are most susceptible to damage  
It is proposed to have last row or two of solid bristles  
with shorter heights. It may be advantageous to have rubber  
pimples 21 just after the last row 20 as shown in Figs. 7 &  
7A.

10

The finger brush can also be a simple thimble type with  
bristles on one side. The brush body 1 is flexible like an  
elastic like the finger elements of a rubber glove and can  
be used for different finger thickness.

15

The embodiment of figs. 2 to 5 are likely to offer least gum  
damage due to straps since the studs would always be away  
from both gums and cheek.

20 The finger brushes depicted in the Figures consist of  
elastic material, particularly rubber or rubber-like  
plastic, polyethylene, polypropylene or the like, which also  
lends itself well to use in an injection moulding process.  
Through the inherent elasticity of the material, the finger  
25 brushes can easily be curved by the finger holding them, so  
as to be able to adapt them to the dental structure and gain  
ready access to all oral areas. Cleaning efficiency can  
thereby enhanced. In addition, the bristles are also  
elastically yielding, preventing injury in the oral cavity  
30 during cleaning.

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The brush body in each of the embodiments is dished and its finger supporting side is generally adapted in shape to the contour of a finger. By this means, the finger is held to the finger brush especially well, preventing inadvertent  
5 detachment of the finger brush from the finger 14 during cleaning.

In the region of the end receiving the finger tip, the dished brush body is formed approximately up to the finger  
10 tip. With these finger brushes the finger nail does not project beyond the free edge of the brush body, but is embedded in the brush body. Hence injuries in the oral cavity by the finger nail when cleaning teeth are prevented.

15 The wall thickness of the brush body 1 is proportioned in such a way that the finger brush on the one hand exhibits sufficient stability to prevent damage of the brush body in use, and on the other hand can be readily curved. In addition, the wall thickness is selected in such a way as to  
20 obtain a short cooling time during injection moulding of the finger brush and thus higher manufacturing output of finger brushes per unit of time. The wall thickness of the brush body is preferably about 0.5 mm to 3mm, particularly about 1mm.

25

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**CLAIMS**

1. Finger brush having a means for adjusting size to suit various finger sizes.

5

2. Finger brush according to claim 1 wherein the means for adjusting comprises holding rings.

3. Finger brush according to claim 1 wherein the means for  
10 adjusting comprises straps.



Fig.1.

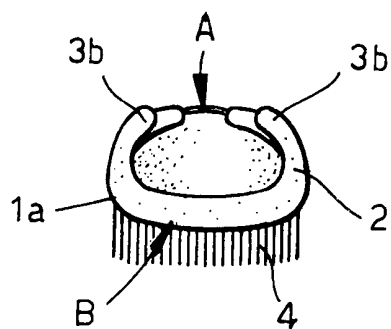


Fig.1 A.

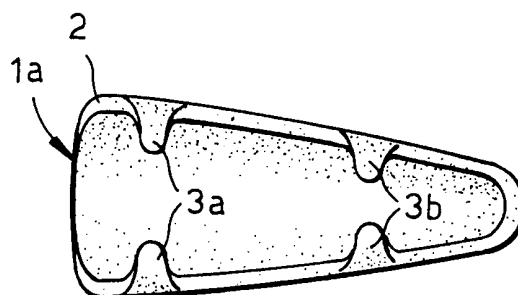


Fig.2.

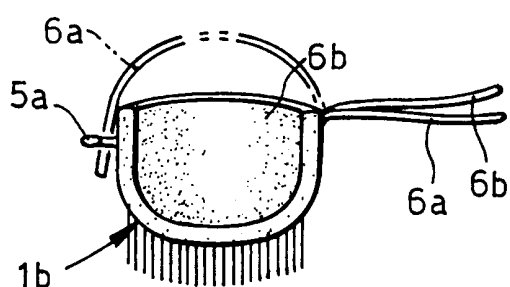


Fig.2 A.

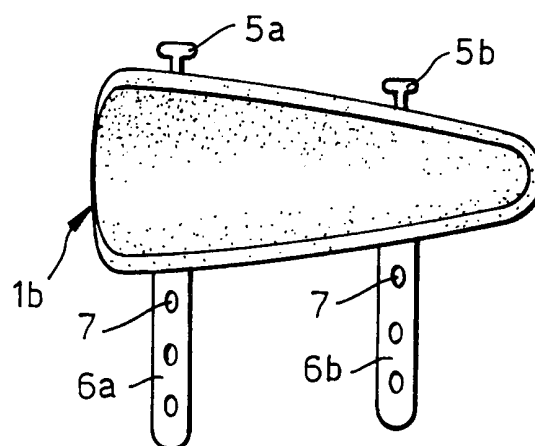


Fig.3.

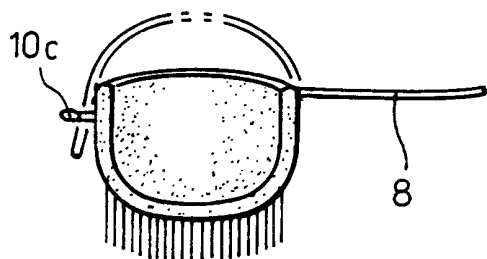
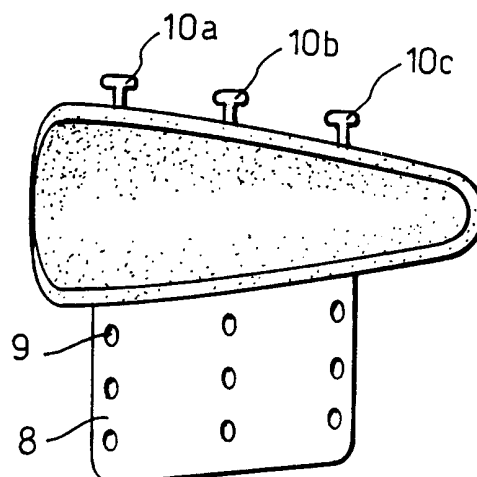


Fig.3 A.



2/2

Fig.4.

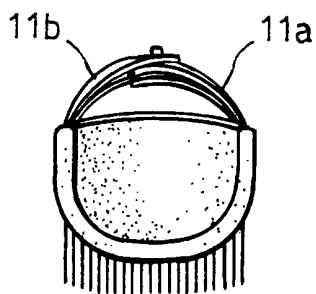


Fig.4A.

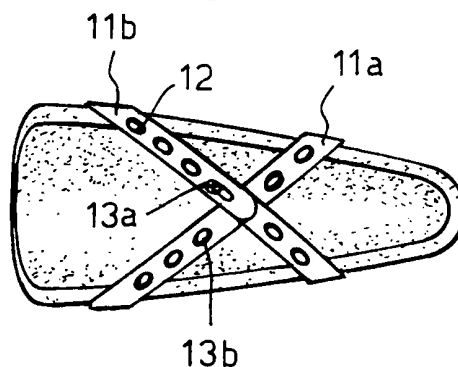


Fig.5.

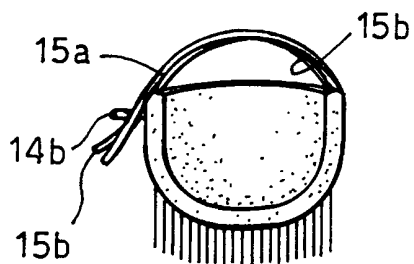


Fig.5A.

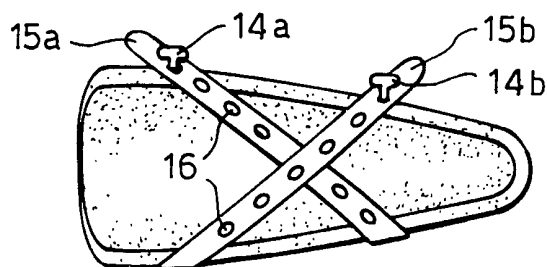


Fig.6.

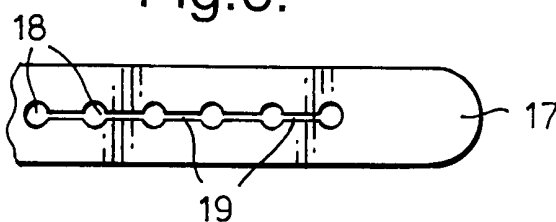


Fig.7.

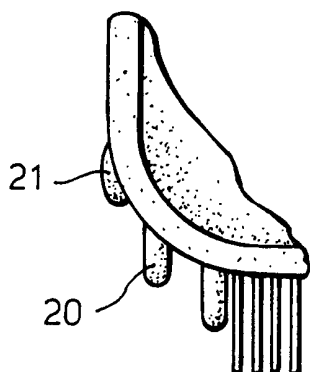


Fig.7A.

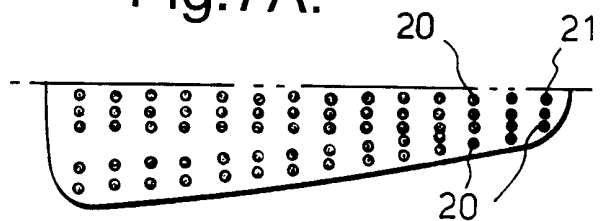


Fig.8.



# INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/10894

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A46B5/04

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)

IPC 7 A46B

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 practical, search terms used)

EPO-Internal, WPI Data, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 332 367 A (GORADIA INNOVATIVE TECHNOLOGIE) 23 June 1999 (1999-06-23) cited in the application & ZA9804872 page 10, line 5 - line 13; figure 3 ---	1,2
X	US 4 134 172 A (ARCE OSCAR A) 16 January 1979 (1979-01-16) column 3, line 52 -column 4, line 36; figures 5,5A ---	1,2
X	WO 99 52396 A (LAI JOO KOI ;TAN YOCK LIN (SG)) 21 October 1999 (1999-10-21) page 9, line 17 - line 26; figures 3A,3B ---	1,2
X	DE 296 01 567 U (FRANK KLAUS PETER) 5 June 1996 (1996-06-05) page 2, paragraph 2; figures ---	1,2
-/--		

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

22 March 2001

Date of mailing of the international search report

29/03/2001

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# INTERNATIONAL SEARCH REPORT

International Application No.

PCT/EP 00/10894

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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