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⑯ Applicant: Kobayashi, Nobutaka  
26-1202 Wakabadai 2-chome,  
Asahi-Ku  
Yokohama-shi(JP)

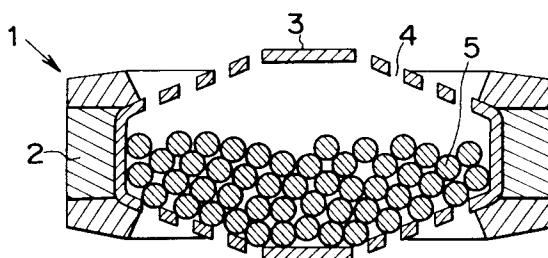
⑰ Inventor: Kobayashi, Nobutaka  
26-1202 Wakabadai 2-chome,  
Asahi-Ku  
Yokohama-shi(JP)

⑲ Representative: Leale, Robin George  
FRANK B. DEHN & CO.  
Imperial House  
15-19 Kingsway  
London WX2B 6UZ (GB)

⑳ Casing for water activating material.

㉑ A casing (1) for water-activating particles has an annular float (2). The casing (1) has openings (4) to allow washing water to flow into and out of the casing (1) and contact the water-activating particles (5) contained therein, to increase the cleaning capability of the washing water circulating in a washing vessel. The annular float (2) is of plastics or rubber and surrounds a body (3) of said casing (1) to permit said casing (1) to float and ride with the swirling circulation of washing water in the washing vessel.

FIG. 7



The present invention relates to a casing for water-activating material.

As is well known, washing is usually carried out in washing machines with the aid of washing material or cleanser such as washing powder or liquid. The amount of washing material used is determined arbitrarily by the user and there is a tendency to use more washing material than is required. The use of an extra amount of washing material is economically disadvantageous as well as being environmentally disadvantageous in that unused washing material flows into the sewer system and finally, into rivers and seas with environmentally damaging consequences.

In an attempt to reduce the amount of washing material required and prevent damage to the environment caused by washing material, water-activating material is used in washing machines. The water activating material is usually received in a casing which is put in a washing vessel of a washing machine along with clothes and other items to be washed. Examples of such water-activating materials are tourmaline, ceramic powder capable of radiating far infra-red rays or piezoelectric ceramic material. For instance, tourmaline has the effect of putting water into an electrochemically unstable condition in which there appear free ions of OH- having no counter ions of H+, which thereby causes surface activities such as penetration, colloidization, dispersion, emulsionization or non-attachment at the interface between clothes and washing water. It additionally has the effect of significantly increasing oxidisation and reduction and oxygen solubility. These effects will expedite the cleaning of clothes and other items during washing by increasing the cleaning capability of the water. The water-activating material is usually in the form of particles, to thereby increase the surface area in contact with the surrounding washing water.

The casing for containing the water activating material should be strong enough to resist the force to which it is subjected to during the washing process. The specific gravity of the material from which the casing is made is larger than that of water, as is the specific gravity of the water-activating material. Accordingly, the casing containing the water-activating material or particles will sink in water so that the water-activating material or particles can work only at the bottom of the washing vessel. To overcome this problem, it has been proposed that the casing containing the water-activating material or particles be put in a bag which receives waste thread or rubbish therein which appears in the washing water. The bag is attached to the inside of the washing vessel of a washing machine.

5 The casing containing water-activating material or particles now received in the bag, cannot sink to the bottom of the washing vessel, but rather floats on the surface of the washing bath. The casing, however, can move only in a limited space at one side of the washing vessel, and therefore the water-activating material or particles cannot be brought efficiently into contact with the washing water. Specifically, washing water is not subjected to the activating effect provided by the water-activating material or particles because the casing remains apart from the swirling circulation of washing water in the washing vessel.

10 15 A further disadvantage is that unpleasing sound or vibration may be caused by the casing striking against the inside wall of the washing vessel.

20 According to the present invention, there is provided a casing for water-activating material for use in a washing vessel, said casing having openings to allow water to flow into said casing and contact water-activating material to be contained therein, thereby increasing the cleaning capability of the water circulating in the washing vessel, characterised in that the casing is provided with a float to cause said casing to flow and ride with the circulation of water in the washing vessel.

25 30 35 Thus embodiments of the present invention are able to provide a casing which permits the full use of water-activating material or particles contained therein by increasing the contact between water-activating material or particles and washing water, so that clothes and other items may be cleaned well with the aid of the surface activity caused by water-activating material or particles such as penetration, colloidization, dispersion, emulsionization or non-attachment at the interface between clothes and washing water.

40 45 Preferably the float is of plastics, rubber (synthetic or natural) or similar material which may surround a body of the casing so that, should the casing strike against the inside wall of the washing vessel, unpleasing sounds or vibrations may also be prevented.

50 55 The float which may be annular permits the casing to float on the surface of the washing bath, riding with the swirling circulation of washing water. The effective use of the surface activity caused by water-activating material or particles permits the cleaning of clothes and other items without using as much cleaning material as would be required if water-activating material or particles were not allowed to work to their limit.

Embodiments of the present invention will now be described by way of example and with reference to the accompanying drawings, in which:

Fig. 1 is a side view of an annular float of a casing assembly according to a first embodiment of the present invention;

Fig. 2 is a side view of a casing body of the casing assembly according to the first embodiment;

Fig. 3 is a side view of the casing assembly according to the first embodiment of the present invention;

Fig. 4 is a plan view of the casing assembly of Fig. 3;

Fig. 5 is a section taken along the line A-A in Fig. 1;

Fig. 6 is a section taken along the line B-B in Fig. 2;

Fig. 7 is a section taken along the line C-C in Fig. 3;

Fig. 8 shows how the casing assembly moves in a washing vessel;

Fig. 9 is a plan view of an annular float of casing assembly according to a second embodiment of the present invention; and

Fig. 10 is a plan view of an annular float of a casing assembly according to a third embodiment of the present invention.

Figs. 3 and 7 show a casing assembly according to a first embodiment of the invention. The casing assembly 1 comprises an apertured casing body 3 for containing water-activating particles 5 therein, and an annular float 2 surrounding the casing body 3.

The annular float 2 is made of plastics, rubber or similar material to permit the casing assembly 1 to float. The float 2 comprises upper annular section 2a, annular barrel section 2b and lower annular section 2c, thus defining a space D as can be seen from Figs. 1 and 5 for receiving the casing body 3.

The casing body 3 has a circular circumference whilst its upper and lower surfaces have concentric slots 4 as can be seen from Figure 4. Water-activating particles 5 are contained in the casing.

The water-activating particles may be any suitable material such as tourmaline, ceramic power capable of radiating far infra-red rays or piezoelectric ceramic material. These materials are capable of providing surface activities and significantly increasing oxidization and reduction as well as oxygen solubility.

As shown in Figs. 3, 4 and 7, the casing body 3 containing the water-activating particles is fitted in the annular float 2 and is clamped between the upper and lower annular sections 2a and 2c of the casing body 3 to thereby retain the casing body 3 in place. Thus, a casing for water-activating particles having an annular float therearound results.

The manner in which such a floatable, casing assembly 1 for water-activating particles is used is described below.

Water and cleanser or cleaning material are put in the washing vessel of a washing machine. Since

the water-activating particles make the cleaning process easier and more effective, less cleaning material or cleanser is required so that only a relatively small amount of cleanser needs to be added to the water.

Clothes and other items to be washed are put in the washing vessel of the washing machine along with the floatable, water-activating particle casing assembly 1. The floatable, water-activating particle casing assembly 1 floats on the surface of the washing bath, allowing washing water to enter the casing 3 via slots 4 and to come in contact with the water-activating particles 5.

When the washing machine is in operation, washing water is usually circulated in the vessel of the machine in a swirling manner. As shown in Fig. 8, clothes 7 move around in the washing bath, and the floatable, water-activating particle casing assembly 1 rides on the swirling circulation of washing water, moving in all directions. For example, it may move on the surface of the washing bath as indicated by arrow A; it may also go down in the washing bath and come back up to the surface, as indicated by arrow B; and it may move together with the moving clothes 7 as indicated by arrow C. As the water-activating particle casing assembly 1 moves through the washing bath, water 6 gets into and out of the inside of the casing 1, thus permitting washing water to contact the water-activating particles 5 evenly. As a result of the annular float 2 of plastics, rubber or similar material surrounding the water-activating particle casing assembly, no sounds or vibrations are caused when the casing strikes against the inside wall of the washing vessel.

As may be understood from the above, the buoyancy of the plastics, rubber or like material permits the floating of the casing and water-activating particles on the surface of the washing water, thus riding with the swirling circulation of washing water, and the casing is able to move in all directions. Washing water can be evenly brought in contact with the water-activating particles, and therefore, the cleaning of clothes is made easier and more effective, and accordingly the amount of cleanser required can be reduced. Further this permits a reduction in the amount of used cleanser discharged to rivers and seas via the sewer system, and the environmental damage can be reduced accordingly.

The annular float may be of any suitable shape such as an elliptical or square shape as indicated respectively by 8 and 9 in Figs. 9 and 10. The casing body may have any suitable shape provided it has openings to permit water to get into and out of the casing.

It should be noted that the casing is not limited in its applications to use in a washing machine but

may be used in any suitable situation where the water activating properties of the material contained in the casing are required.

**Claims**

5

1. A casing (1) for water-activating material (5) for use in a washing vessel, said casing having openings (4) to allow water to flow into said casing and contact water-activating material to be contained therein, thereby increasing the cleaning capability of the water circulating in the washing vessel, characterised in that the casing is provided with a float (2) to cause said casing to flow and ride with the circulation of water in the washing vessel.

10

2. A casing as claimed in claim 1, wherein said float is of plastics or rubber.

20

3. A casing as claimed in any preceding claim, wherein a body (3) of said casing has a substantially circular cross-section.

25

4. A casing as claimed in any preceding claim, wherein said float is of annular shape.

30

5. A casing as claimed in any preceding claim, wherein said float surrounds a body (3) of said casing.

35

6. A casing as claimed in claim 5, wherein said casing body (3) is retained in place in said float by upper (2a) and lower (2c) shoulder portions of said float (2) abutting against opposed upper and lower portions of said casing body.

40

7. A casing as claimed in claim 6, wherein said shoulder portions (2a,2c) of said float (2) are separated by a substantially cylindrical portion (2b) having an internal diameter substantially corresponding to the outer diameter of said casing body (3), said internal diameter being less than that of said shoulder portions (2a,2c).

45

8. A casing as claimed in any preceding claim, wherein the outer circumference of the float is substantially circular, elliptical or square.

50

9. A casing as claimed in any preceding claim, wherein said openings in said casing are in the form of concentric slots (4) arranged on at least one face of said casing.

55

10. A casing as claimed in any preceding claim, containing water-activating particles.

FIG. 1

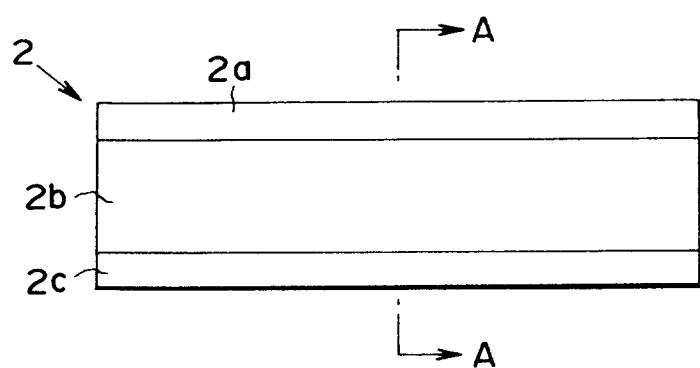


FIG. 2

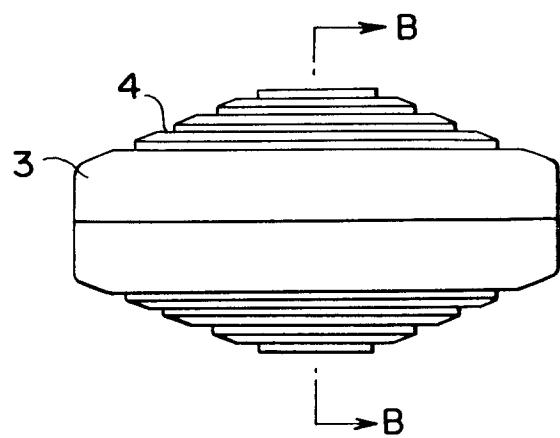


FIG. 3

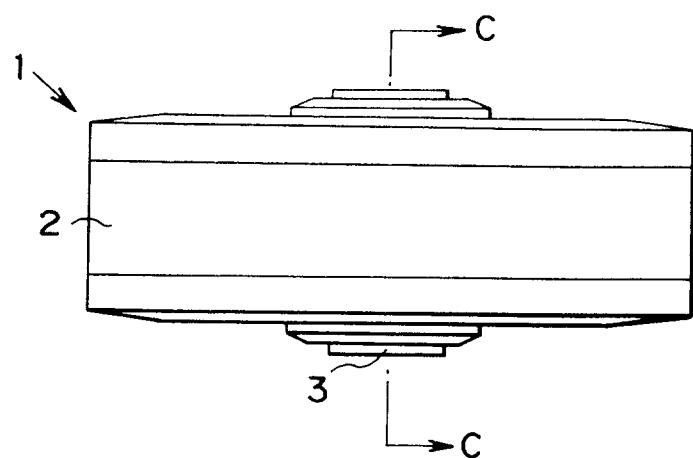
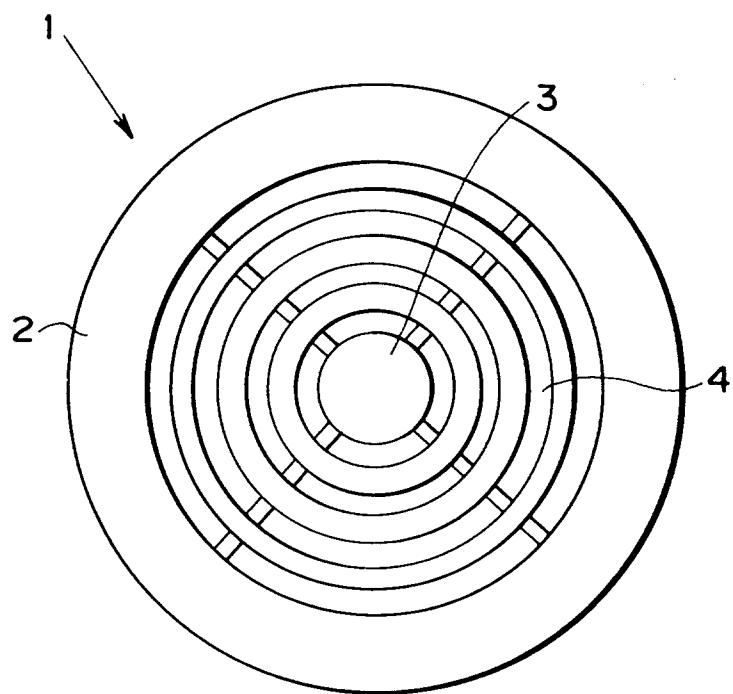
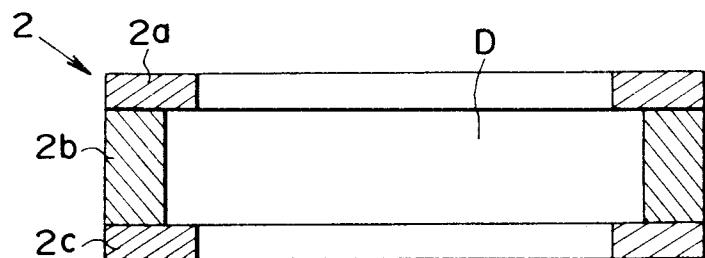


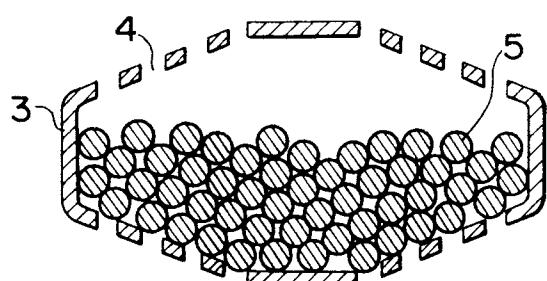
FIG. 4



**FIG. 5**



**FIG. 6**



**FIG. 7**

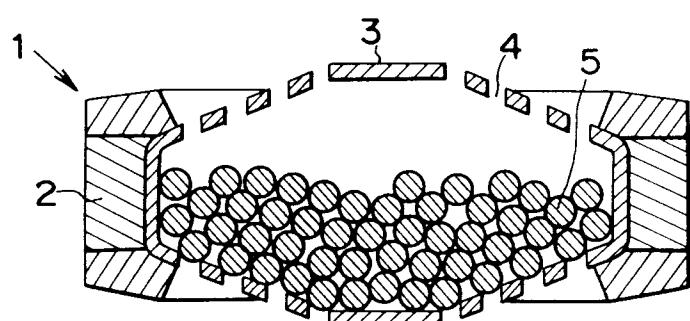
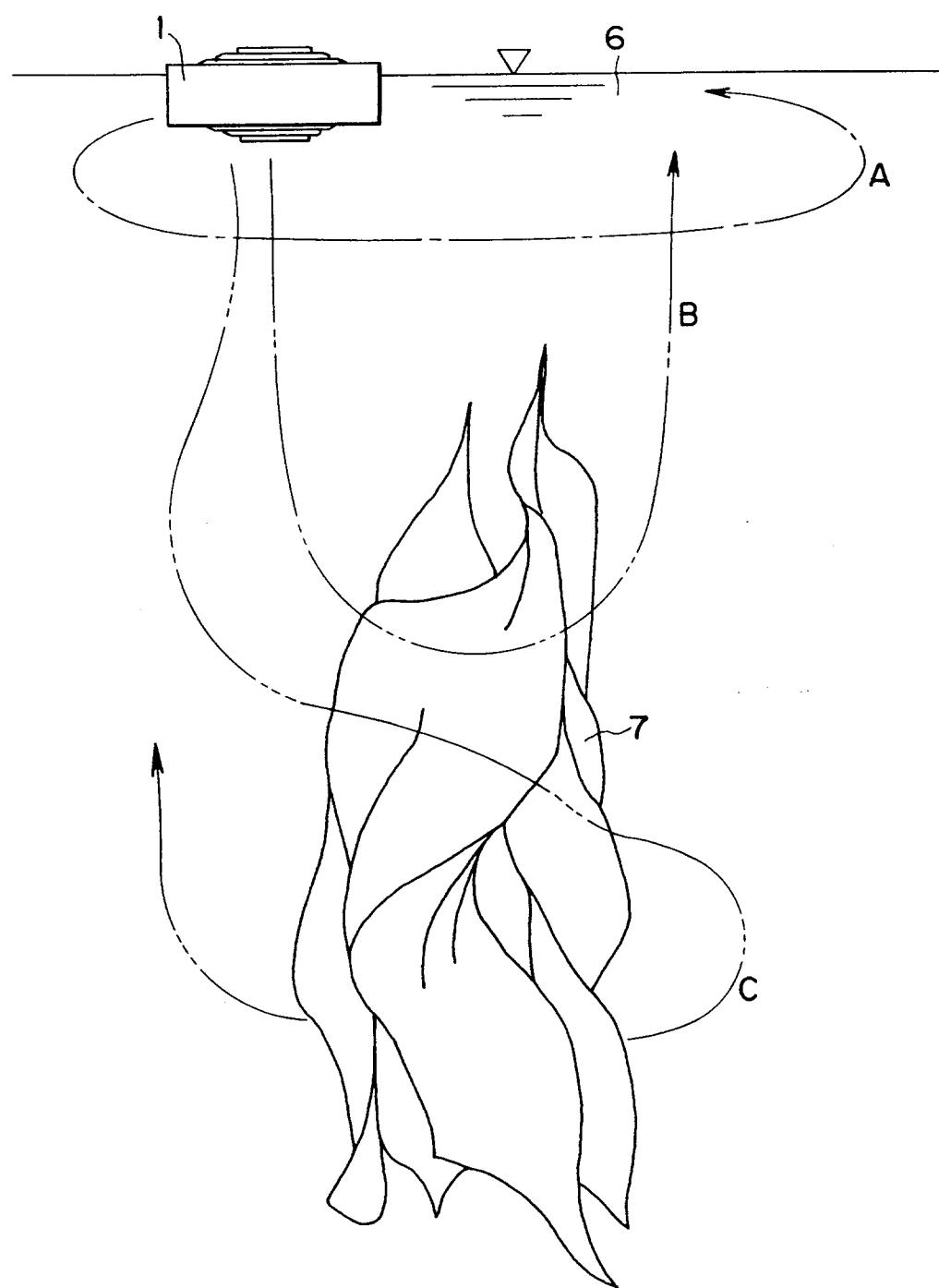
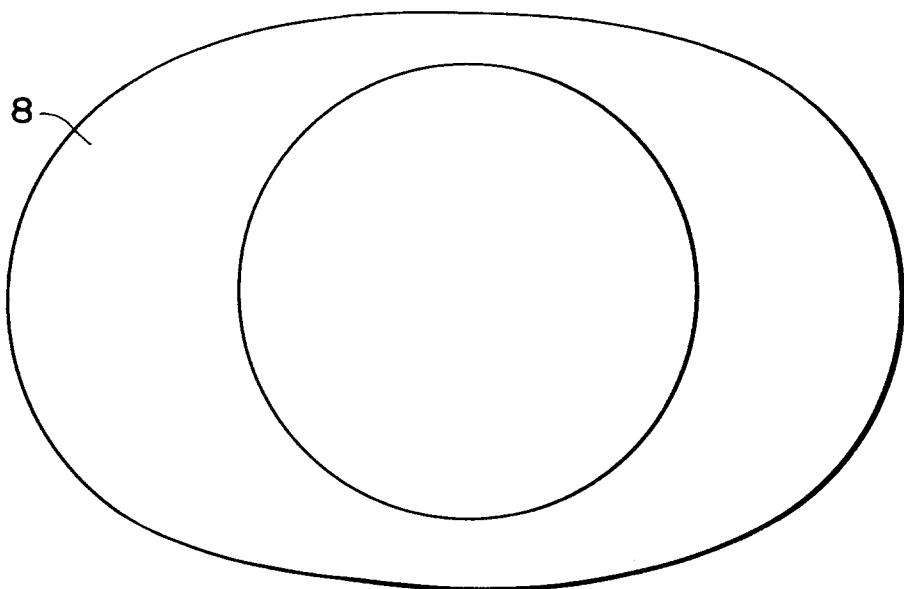


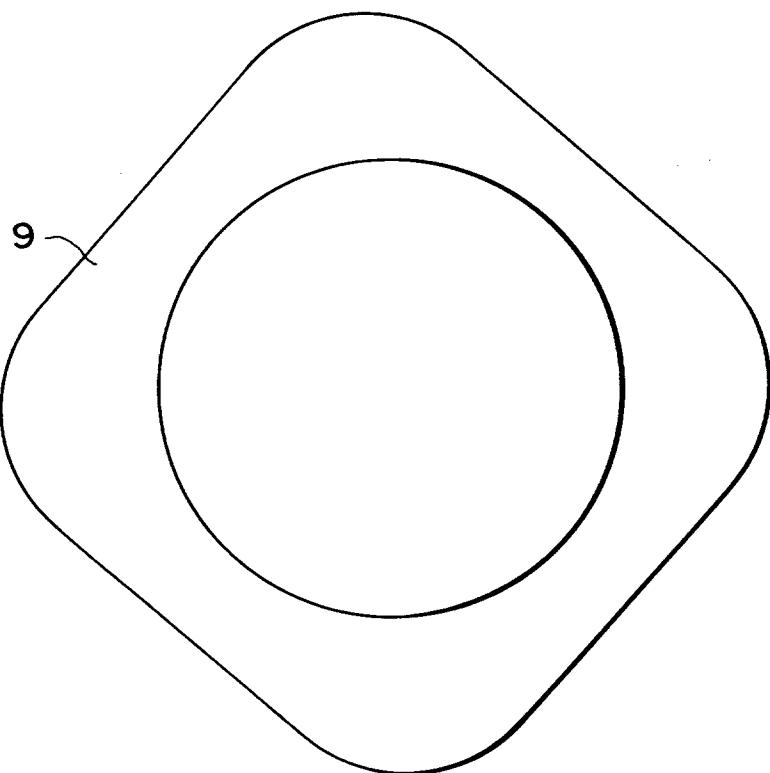
FIG. 8



**FIG.9**



**FIG.10**





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EUROPEAN SEARCH REPORT

Application Number

EP 92 30 5454

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	JP-U-5 075 567 (TOKYO SHIBAURA DENKI K.K.) * figures * ---	1-3,8-10	D06F39/02
X A	US-A-3 400 808 (COLGATE-PALMOLIVE COMPANY) * column 1 - column 2; figures * ---	1-3,8,10 9	
X	GB-A-683 515 (D.F. BRAUN) * claims; figures * -----	1-3,8-10	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			D06F
<p>The present search report has been drawn up for all claims</p>			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	16 FEBRUARY 1993	COURRIER G.L.A.	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	
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