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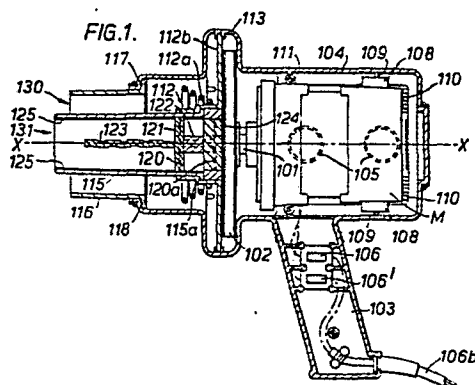
(54) Apparatus for grooming hair.

(57) Apparatus in the form of a hand-held appliance for grooming hair comprising:

means (a) for applying suction to a local portion of the head,

means (b) for applying heated air to the said portion and/or to an immediately adjacent portion,

the apparatus including an electric motor drivingly connected to an impeller and arranged to enable a small section of hair to be lifted and dried by a suction-induced air current from the inlet of the impeller and by hot air from the outlet of the impeller, characterised in that the suction means (a) comprises a first generally straight duct portion having an inlet nozzle for engaging the hair arranged in a plane generally perpendicular to the direction of air flow, an outlet in communication with the suction side of the impeller, and an airpervious hair blocking means located between the nozzle and the outlet, the heat applying means (b) including a second duct portion, generally co-axial with the first duct section.



APPARATUS FOR GROOMING HAIR

The present invention relates to apparatus for grooming hair.

Modern hair styling makes ever increasing demands
5 upon the hairdresser and there is a demand for a more sophisticated aid to dry and set the hair. Presently available aids are effectively limited to floor mounted hair drying caps and hand-held blow dryers which have been known for many years.

10 The principal Inventor has recently developed a characteristic form of hairstyling which requires the hair to be lifted out from the scalp while being dried and set accompanied by a continuous manipulation of the dryer which deliberately avoids a carefully curled or "permed"
15 appearance. At present this requires the client to bend forwardly so that the hair falls downwardly away from the scalp while it is groomed and set. This clearly leads to inconvenience both to the client and to the hairdresser and renders the process tedious and difficult.

20 The invention is aimed at providing an appliance which will overcome or reduce the difficulties in this method of hairstyling in particular and which will also

allow for further experimentation in new forms of hairstyling.

In general the invention relies upon the provision of means to apply suction to a local portion of the head in order to lift the hair while it is being dried. The application together of suction and drying is not new in itself. Various devices have been proposed over the years in which some form of suction is used, but these have been restricted to cumbersome floor mounted pieces of apparatus which cannot be used for grooming in the modern sense of using the hands to manipulate and model the hair. Thus British Patent No. 22463 of 1902 describes a floor mounted apparatus in which long hair, as currently in fashion, was laid flat over a piece of lint and air drawn through the lint at the same time as warm air was applied over the top. This form of apparatus would be clearly unsuited to modern needs.

More recently hand appliances have been devised as an aid to permanent waving. Thus WO-00347 and French Patent 2 435 925 show devices of this kind which utilise a spiral chamber into which the hair is sucked and heated over a significant period of time. In WO-00347 a significant cooling period is said to be necessary following the heating period in order to achieve a permanent set. These devices would be quite unsuitable to the styling technique above described.

In U.S. Patent 4 210 162 a similar type of permanent styling is described using an elongate chamber open at the side. The device normally uses a floor mounted motor unit with a double duct for suction and blowing. This
5 can be replaced by a portable motor unit which is adapted to be connected to the double duct connection on the chamber unit. The result is a heavy and awkward apparatus which is not suitable for the styling technique above described.

10 According to the present invention there is provided apparatus in the form of a hand-held appliance for grooming hair comprising:

means (a) for applying suction to a local portion of the head,

15 means (b) for applying heated air to the said portion and/or to an immediately adjacent portion,

the apparatus including an electric motor drivingly connected to an impeller and arranged to enable a small section of hair to be lifted and dried by a suction-
20 induced air current from the inlet of the impeller and by hot air from the outlet of the impeller, characterised in that the suction means (a) comprises a first generally straight duct portion having an inlet nozzle for engaging the hair arranged in a plane generally perpendicular to
25 the direction of air flow, an outlet in communication

with the suction side of the impeller, and an air-pervious hair blocking means located between the nozzle and the outlet the heat applying means (b) including a second duct portion, generally co-axial with the first
5 duct section.

Preferably the duct sections and impeller are arranged on a common axis, the impeller is of centrifugal or aerofoil type, having a central inlet at the outlet of the first duct and a shroud defining an extension of the
10 second duct portion, and wherein an electric resistance heater is circumferentially arranged within the said second duct extension.

Preferably the hair blocking means is adjustable in position lengthwise of the suction duct.

15 Preferably a central spindle extends centrally through the first duct section and centrally through the hair blocking means.

Preferably the hair blocking means is shaped to provide a part-toroidal surface which is concave on the
20 suction nozzle side.

Embodiments of the invention are hereafter described with reference to the accompanying drawings, in which:-

Figure 1 is an axial sectional view (in part) of a
25 form of appliance in accordance with the invention,

Figure 2 is a rear end view of the embodiment of Figure 1,

Figure 3 is an exploded perspective view of a modification of the embodiment of Figure 1,

Figure 4 is a view corresponding with the forward end portion of Figure 1 of the modification of Figure 3,

5 Figures 5 and 6 are axial sectional views of extension duct sections of different length for the modification of Figures 3 and 4.

Figure 7 is an axial sectional view of a modified duct arrangement, and

10 Figure 8 is an end view of the arrangement of Figure 7.

15 Figures 1 to 5 are approximately to scale and the overall length of the embodiment of Figure 1 along the axis X-X is 24.5 cms. The motor M is a 290 watt series-wound AC motor producing 13,000 rpm. The motor shaft 101 drives a seven bladed aerofoil fan 102. The handle 103 is formed with the external cover portion 104 in two mouldings 104a, 104b (Fig. 3) which fit along

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the plane A-A of Figure 2. The cover portion 104 is provided with dished apertures 105 which provide a current of air through the motor for cooling purposes. As will become apparent, this air draft, which is partially
5 heated by the motor combines with the warm air draught down the outer (130) of two coaxial ducts 130,131. Switches 106,106' for the motor and heating element 117 are provided in the handle 103, which is provided with access apertures 106a (Fig. 3), and the electric lead
10 106b passes through the bottom of the handle. The cover portion 104 is provided with a channel section 107 to clear the motor brush housings indicated at 108.

The motor is maintained in position within cover portion 104 by moulded ribs shown at 109,110,111,
15 the last having an aperture for a bolt 111a (Fig. 2) connecting the mould halves 104a,104b. A second bolt 133a held in projections 133 secures the handle 103 with the aid of spacers 134 (Fig. 11) which are omitted in Fig. 1.

Forward of the fan 102 is situated an inner duct
20 extension moulding 112 which is formed with a rearward, radially outwardly stepped shoulder 112a and a radial flange 112b which seats at its extremity in a channel moulding 113 formed in an annular outwardly projecting portion of the moulding 114. As shown in Figure 3,
25 the flange 112b is formed with elongate recessed portions 114 in its periphery to provide slots for the

passage of air directed centrifugally outwardly by the fan and which ultimately exits through duct 130. The shoulder 112a receives a flange 115a and an inner duct forward moulding 115.

5 The forward end of the outer duct is formed as a moulding 116 having a flange 117 which seats within a channel 118 formed at the forward end of the casing 104.

 The inner duct moulding portion 115 of Figure 1 is constituted by a differently formed member in Figure 2
10 which will be described subsequently.

 A spiral electric heating element 119 surrounds the inner duct extension member 112 upon which it is supported by a refractory support 119a (Figure 3). Figures 1 and 3 show different arrangements of the
15 heating element and support.

 The embodiment of Figures 1 to 5 exhibits a preferred feature of the invention according to which there is provided a hair spreading and blocking means located within the suction duct. The hair spreading
20 means takes the form a piece of mesh material 120 e.g. of nylon or stainless steel which extends across the suction duct 131 (defined by mouldings 115, 112). In Figures 1 and 2 the hair spreading means is adjustable in position lengthwise of the suction duct 131. This is accomplished
25 by mounting the periphery of the mesh in a ring moulding

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121 which is connected by spokes (not shown) to a hub 122 which is threadedly engaged with a threaded shaft 123. The shaft 123 is in turn supported on a spoked supporting structure 124 which is rigidly mounted within shoulder 112a and which supports a second gauze 120a for safety purposes. The outer periphery of the ring 121 is grooved to engage with longitudinal splines 125 on the inner surface of the forward inner duct moulding 115. The moulding 115 is rotatably engaged within the moulding 112 and projects forwardly of the outer duct moulding 116. Thus the forward end of moulding 115 can be held by the fingers and rotated to cause the ring 121 and mesh 120 to travel along the shaft 123 to any desired position within the suction duct 131.

It has been found that when dealing with short hair in particular, it is convenient to have the hair spreading means located quite close to or in some cases at the extreme end of the suction duct. This allows the hair to be drawn out and manipulated in the course of drying to produce a bunched or curled effect rather than cause it to be stretched straight outwardly from the roots.

As an alternative to a travelling mesh support, the latter may be arranged in one of a set of removable duct members, the set including mesh supports arranged

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at different positions. The duct members may be constituted by inner duct sections or sections providing inner and outer duct parts.

Figures 3, 4, 5 and 6 show yet another arrangement for providing for the mesh 120 at different positions within the inner duct. In Figure 4 the inner duct section 115' corresponding to the section 115 of Figure 1 is somewhat shortened in length and the mesh 120 is fixed adjacent the forward end. Likewise the outer duct member 116' corresponding to the member 116 of Figure 1 is also shortened in length. Longitudinally extending shallow tapered ribs 135 are provided at spaced positions on the outer surfaces of duct sections 115' and 116' to provide for the frictional attachment of extension duct sections of different length as illustrated in Figure 5 and Figure 6. Each of these consists of a single rigid moulding comprising an outer duct portion 136 and an inner duct portion 137 interconnected by four circumferentially spaced spokes 138. The rearward inner surfaces of the ducts are rebated with a shallow inward taper at 139 so that the rebated surfaces may frictionally engage with the tapered ribs 135.

It will be apparent in the embodiment of Figures 3 to 6 that the apparatus may be used in the

arrangement as shown in Figure 4 or, for dealing with longer hair, with one or other of the extension ducts respectively illustrated in Figures 5 and 6.

5 A safety mesh 121 may be provided at the rearward end of inner suction 115'.

It will be apparent that an adaptor piece similar in construction to Figures 5 and 6 may be used to close off the suction duct and extend the outer duct preferably with an inward taper so as to convert the apparatus to a
10 conventional hair dryer.

The embodiment of Figure 3 has some additional modifications over that of Figure 1 including the spacers 134 already mentioned and the heating element arrangement 119, 119a, and also a differently positioned aperture 140
15 for the electric lead.

A modified form of duct section and travelling hair spreading and blocking means as shown in Figures 7 and 8. The suction duct is defined by a straight cylindrical duct portion 215 and the hot air duct is defined between
20 the duct wall 215 and an outer straight cylindrical duct portion 216. At the front end these ducts are substantially coterminus. At the rear end they are mounted to portions of the fan and motor housing generally indicated at 212 and 213. The hair spreading
25 and blocking means in the form of a self-supporting mesh

e.g. of wire 220 is mounted on a sliding ring 221. To enable control of the sliding ring 221, diametrically opposite slots 224,225 are provided in the outer duct piece 216 in correspondence with similar slots 225,226 in the inner duct piece 215. Plate-like ribs 227,228 extend through the slots and connect the ring 212 to sliding handle pieces 229, which may be substituted by a continuous ring which slides along the outer duct piece 216.

It will be evident that the inner ring 221 slides against the inner wall of the duct piece 215 and with the mesh 220 substantially closes the inner duct and prevents the hair from passing in the direction of the fan, although the air can be easily sucked through.

A central spindle 230 is preferably provided, although it can be omitted if desired. This can be mounted by means of ribs 231. It can serve as an additional support to the mesh, which requires to be apertured in order to slide along the spindle and if necessary reinforced by an additional ring member.

In accordance with an important preferred feature, the mesh is shaped as shown in Figure 7 so as to provide a toroidal depression 232 which is concave towards the nozzle end (i.e. convex towards the impeller). This has

been found to be extremely beneficial to achieving good styling and this is particularly so if the spindle 230 is employed, when the hair will tend to curl around the spindle to produce extremely pleasing effects.

5 It will be evident that in all of the embodiments the device is adapted to be moved fairly rapidly and continuously over the subjects head so that individual styling techniques can be obtained. It is an extremely flexible styling tool when compared with tools which
10 merely produce a set curl to a particular lock of hair.

 It will be apparent that the features of any one particular embodiment described can be used in combination with features of another embodiment where suitable.

CLAIMS:

1. Apparatus in the form of a hand-held appliance for grooming hair comprising:

means (a) for applying suction to a local portion of the head,

means (b) for applying heated air to the said portion and/or to an immediately adjacent portion,

the apparatus including an electric motor drivingly connected to an impeller and arranged to enable a small section of hair to be lifted and dried by a suction-induced air current from the inlet of the impeller and by hot air from the outlet of the impeller, characterised in that the suction means (a) comprises a first generally straight duct portion having an inlet nozzle for engaging the hair arranged in a plane generally perpendicular to the direction of air flow, an outlet in communication with the suction side of the impeller, and an air-pervious hair blocking means located between the nozzle and the outlet, the heat applying means (b) including a second duct portion, generally co-axial with the first duct section.

2. Apparatus according to claim 1 wherein the duct sections and impeller are arranged on a common axis, the impeller is of centrifugal or aerofoil type, having a central inlet at the outlet of the first duct and a shroud defining an extension of the second duct portion, and wherein an electric resistance heater is circumferentially arranged within the said second duct extension.

3. Apparatus according to claim 2 including a fresh-air inlet upstream of said heater and motor and arranged for inducting fresh dry air to cool the motor and to be expelled into the forced air current.

4. Apparatus according to any preceding claim including a nozzle piece arranged to close the suction nozzle to convert the apparatus for drying with warm air in the absence of suction.

5. Apparatus according to any preceding claim including extension nozzle pieces of different duct length attachable to the remainder of the apparatus to alter the effective position of the hair spreading means.

6. Apparatus according to any of claims 1 to 4 wherein the hair blocking means is adjustable in position lengthwise of the suction duct.

7. Apparatus according to claim 6 wherein a central spindle extends centrally through the first duct section and centrally through the hair blocking means.

8. Apparatus according to claim 6 or claim 7 wherein the hair blocking means is shaped to provide a part-toroidal surface which is concave on the suction nozzle side.

9. Apparatus according to any of claims 6 to 8 wherein the hair blocking means is adjustable by means of a threaded spindle on which it is rotatably engaged.

10. Apparatus according to any of claims 6 to 8 wherein the hair blocking means is adjustable by means of a slide engageable from outside the second duct section and connected to the hair blocking means through slots in the duct walls.

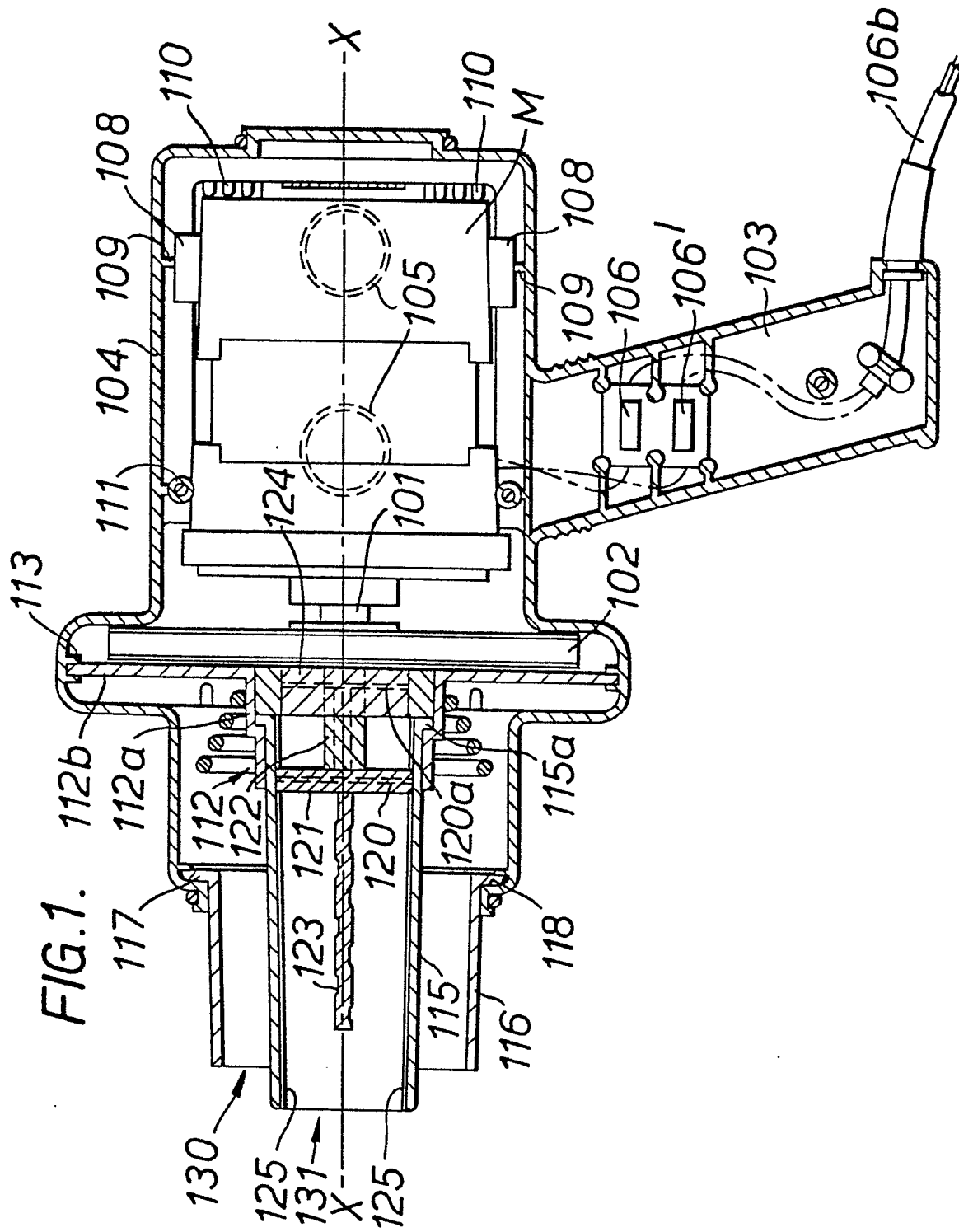


FIG. 2.

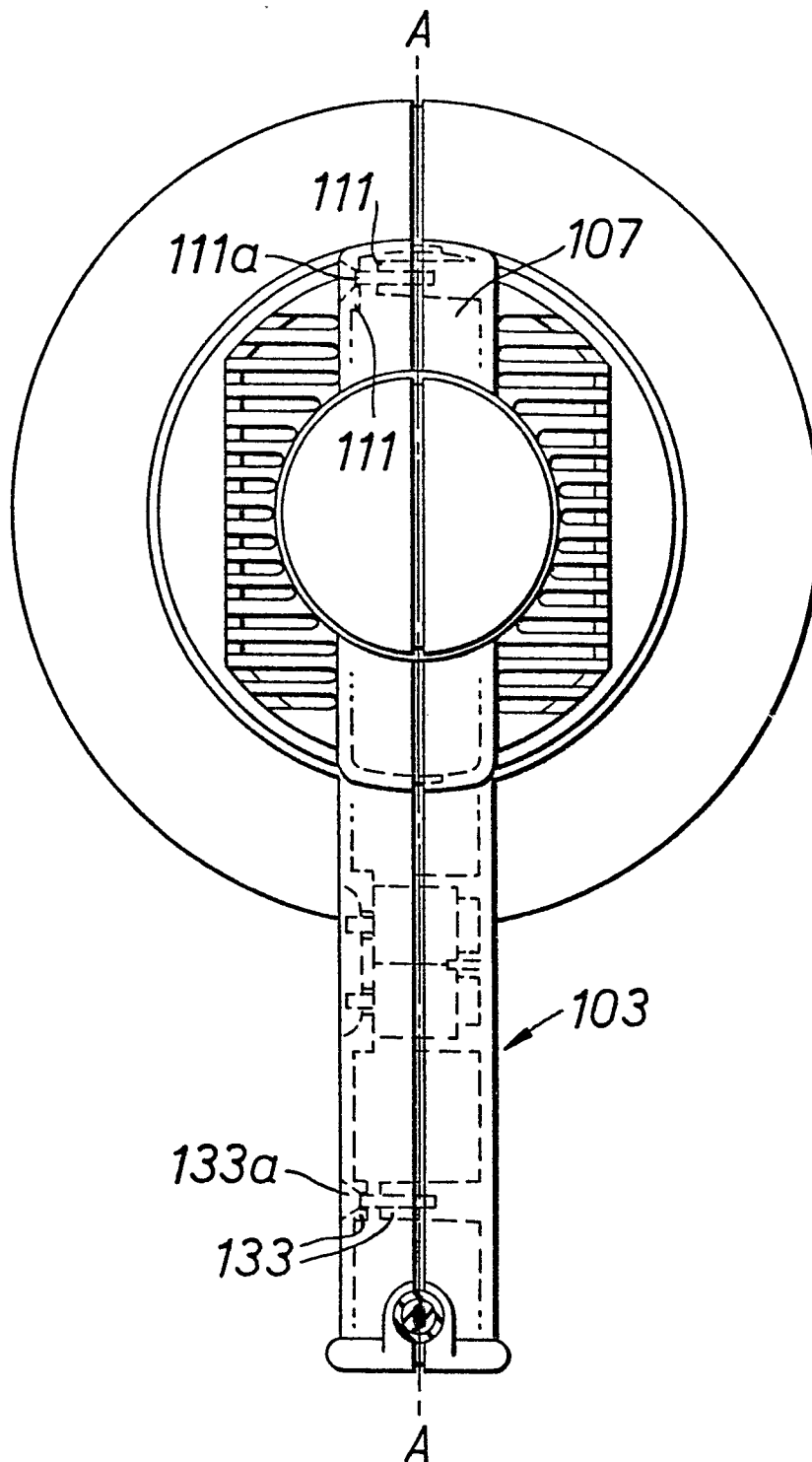
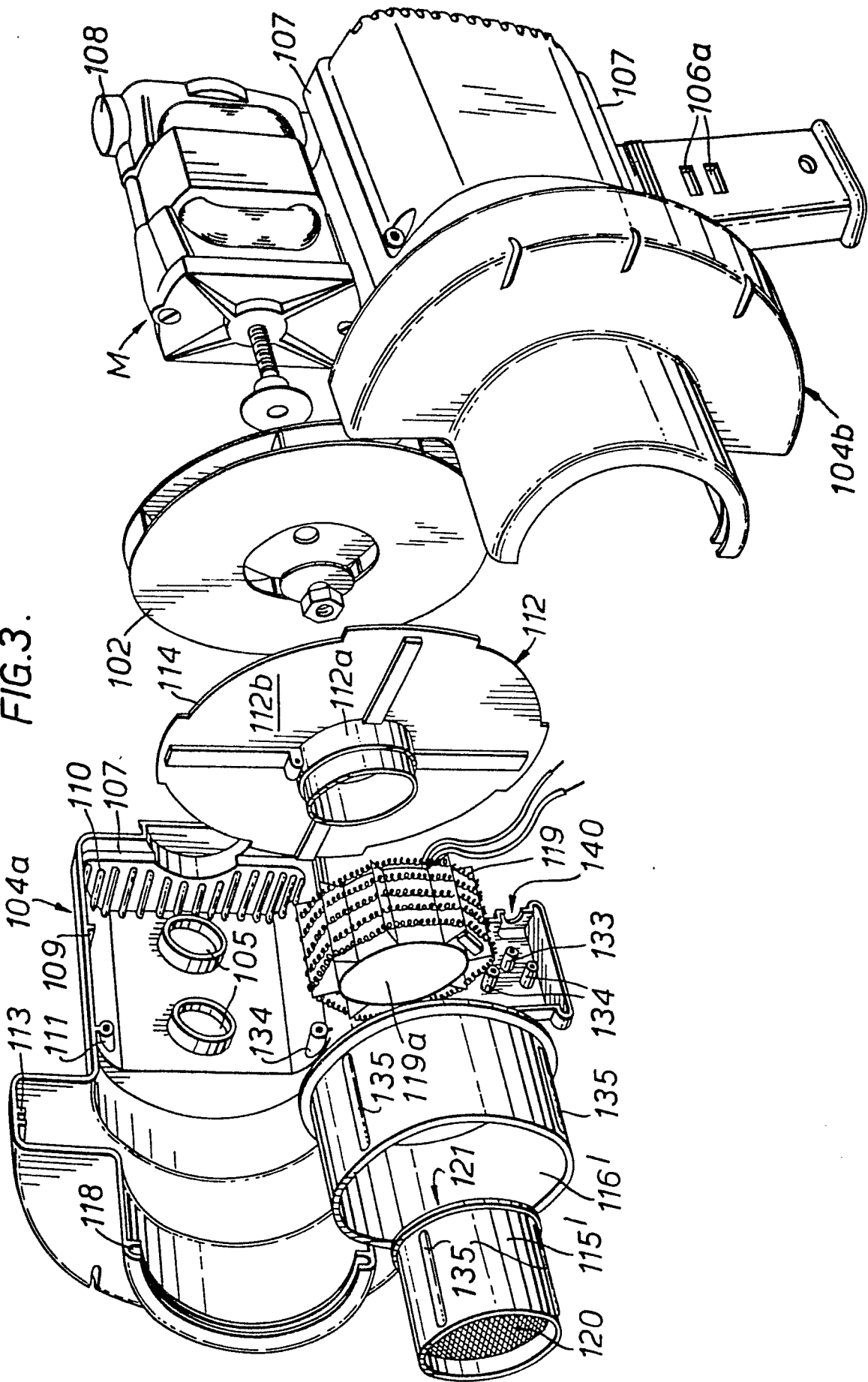


FIG. 3.



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FIG. 4.

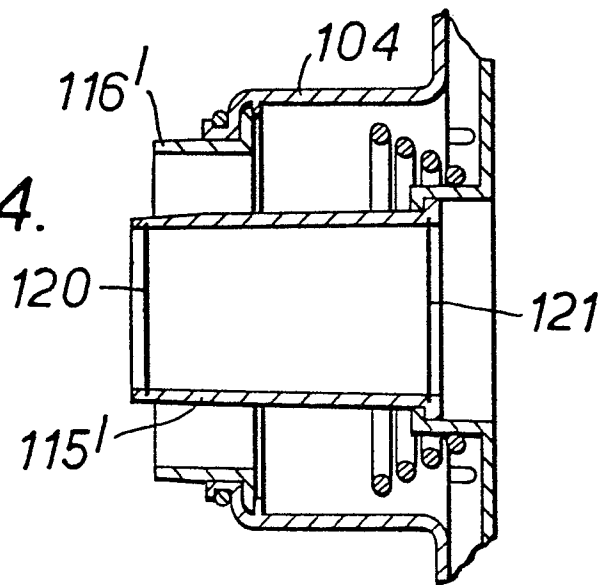


FIG. 5.

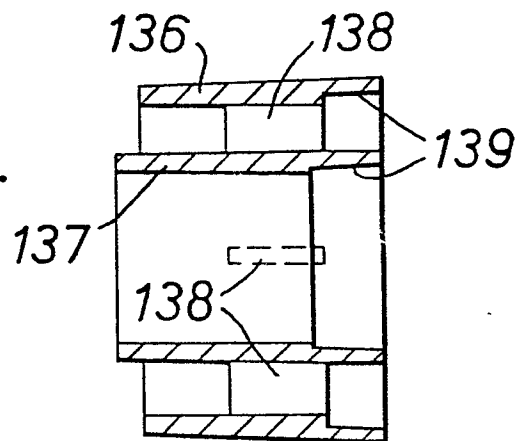
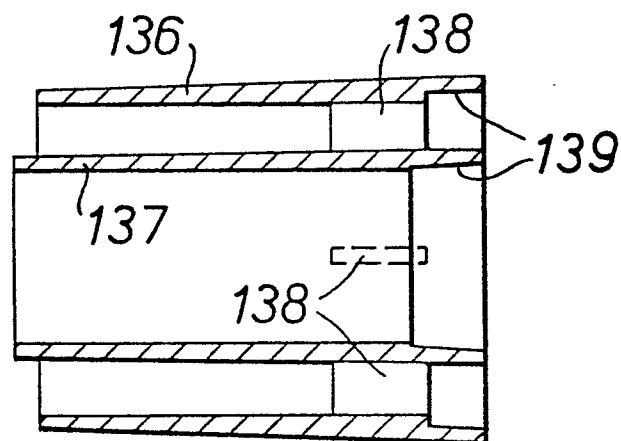


FIG. 6.



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FIG. 7.

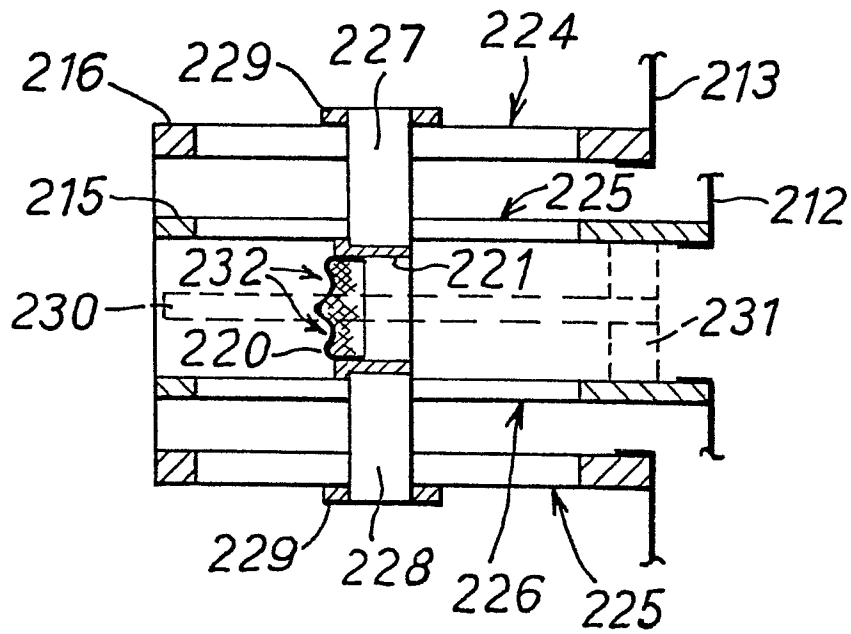
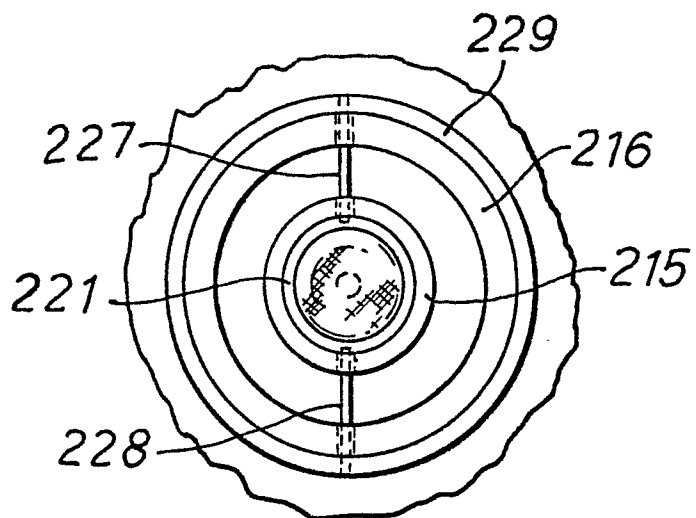


FIG. 8.





European Patent
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EUROPEAN SEARCH REPORT

0064405

Application number

EP 82 30 2255

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. 3)
A, D	FR-A-2 435 925 (DROIN)		A 45 D 2/00 A 45 D 6/06
A, D	US-A-4 210 162 (DREYER)		
A, D	WO-A-8 100 347 (JOSEFSSON)		
			TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
			A 45 D H 05 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 09-08-1982	Examiner SIGWALT C.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		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	