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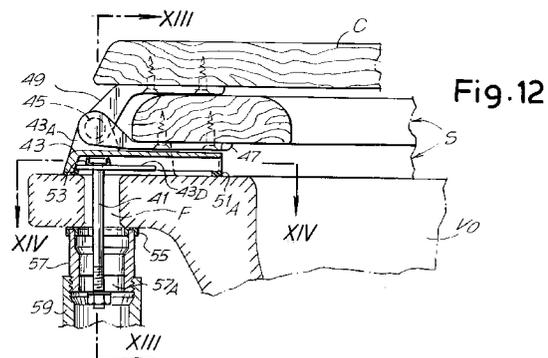
Applicant : **PROMID S.r.l.**
Via del Giglio 6
I-50123 Firenze (IT)

Inventor : **Gagliano, Bruno**
Viale Amendola N.38
I-50121 Firenze (IT)
Inventor : **Cecchi, Marco**
Via della Vigna n.7
I-50046 Poggio a Caiano, Firenze (IT)

Representative : **Mannucci, Gianfranco,**
Dott.-Ing. et al
Ufficio Tecnico Ing. A. Mannucci Via della
Scala 4
I-50123 Firenze (IT)

Device for the elimination of unpleasant bathroom odors directly from the water-closet.

To eliminate unpleasant odors from the pan of the water-closet, the device comprises means for the suction of unpleasant odors directly from the bowl of the water-closet, particularly through apertures (43B) formed in the seat (S) supports (43), and means for the elimination of the unpleasant odors by means of suction through holes (F) provided for in the pan for the application of said supports.



The device in question has the object of providing the suction of unpleasant odors directly from the water-closet bowl and the elimination of unpleasant odors through a special filter or by directly conveying them into the water-closet waste pipe itself or to other vent pipes.

Before they are dispersed into the environment, the unpleasant odors are sucked directly from the water-closet bowl through suction apertures. By means of suitable connections and pipes, the said suction apertures are connected to an external filtration or discharge unit. The device also includes an apparatus for detection of active masses, particularly persons, with at least one sensor, which may be a proximity sensor, either radar, ultrasonic, microwave, infra-red, gravity, or other type; the connecting cable of the various detection systems passes through the interior of the aperture and/or of the pipes. The sensor or group of sensors are such that, when-anyone touches or sits on the seat, the sensor or at least one of the sensors detects the presence of the user and produces a command to the motor of the external unit, which causes a pressure drop in the hollow of the bowl and consequently a suction effect.

The claims define the invention.

The invention will be more readily understood by following the description and the attached drawing which shows a practical non-restrictive example of the invention. In the drawing,

Figs. 1, 2, 3, and 4 show various possible arrangements of the suction apertures;

Fig. 5 shows a suction and filtration unit;

Fig. 6 shows a transverse section of an aperture;

Fig. 7 shows a schematic transverse section of a seat incorporating a sensor;

Fig. 8 is a block diagram;

Fig. 9 shows a solution with the fitting on the pan; Figs. 10 and 11 show a perspective exploded view of an embodiment of the invention;

Figs. 12, 13 and 14 show sections taken along line XII-XII in Figs. 13 and 14, line XIII-XIII in Fig. 12 and line XIV- XIV in Fig. 12, respectively.

In the drawing, 1 in Fig. 1 indicates an aperture incorporated in the porcelain of the pan V; 3 in Fig. 2 indicates an aperture incorporated in the seat S; in Fig. 3, apertures 5 are interposed between the edge of the bowl or pan V and the seat S; in Fig. 4, apertures 7 are combined with the hinged supports A of the seat S. In all cases, seals such as 9 in Fig. 2 may advantageously be provided between the seat S and the pan V, to facilitate the pressure drop in the pan.

Fig. 5 shows a diagram of a unit 10 which is connected with suitable ducts to the aperture or apertures. 11 indicates the suction extractor and 13 indicates a filter; a discharge duct may be provided instead of the filter discharging outdoors. 15 indicates an electronic circuit card.

Fig. 6 shows the profile of an aperture 17 of the

type used in the solution in Fig. 4.

Fig. 7 indicates a seat S in which is incorporated a sensor 19. As an alternative, the sensor may be provided by the varnish or paint of the seat itself, which may have a suitable composition, e.g. including metallic components.

In Fig. 7 the seat, with or without the sensor, has a projecting bead So which acts as a support and seal, with a hollow I for an aperture as at 17 (or that of a subsequent example).

Fig. 9 shows a solution in which a suction unit 110 - which in this case does not require the presence of a filter - is fitted directly against the rear of the pan Vx, so that suction may be provided directly from apertures such as 1, 5, or 7, while a flexible duct 112 may discharge downstream of the siphon VS of the pan V. The pan may have breakable diaphragms for putting into operation the apertures and the discharge of the duct 112.

The air from the bowl or pan V, sucked through the suction apertures and the connecting pipes, is passed through the unit 11 to the filter 13 (or vice versa) where it is purified by means of active filters and, after being lightly perfumed, is returned to the environment. Where possible, in the presence of accessible vent pipes or of the discharge pipe of the siphon of the pan, the stale air leaving the unit 11 is directly sent to these pipes through a non-return valve and is thus expelled without the necessity of filtering. In an alternative solution the air, directly sucked through an aperture advantageously located in the porcelain of the bowl or pan V, may be introduced into the discharge pipe of the water-closet itself, after the siphon, through a non-return valve, in such a way that the whole system may be restricted to the interior of the pan assembly (see Fig. 9).

Obviously, the flow of external air into the interior of the bowl must be kept to a minimum in order to reduce the volume of air to be sucked, so that the rotation speed of the motor may be kept to a level such that no annoying noise is caused. Consequently, a seal such as that indicated by 9 or similar, or a special section of the seat S, as indicated by So in Fig. 7, may be present to make the seat fit perfectly on the upper edge of the water-closet pan.

For detection by a proximity sensor, the detector probe may be inserted directly into the seat and connected to the circuit card by a cable which may for example be located inside the connecting pipes. A sensor may also be directly connected to a member which is already present, such as the inductive paint of the seat or other.

The electrical circuit card 15 for the control and monitoring of the device may be considered as consisting of a number of sections (Fig. 8) including a power supply unit 21, supplied by a transformer 23; a detection sensor 35; a timer 37; and a control unit 39 for the motor 11M of the unit 11. The sensor is con-

nected to one or more probes 35A of one or more of the types mentioned above.

Figs. 10 and following show an embodiment which develops the above mentioned ideas, and in particular those of Figs. 4 to 6.

It is known that the rear edge Vo of the pan V has two relatively large holes F, each of which holds, with a large amount of play, the threaded rod 41 for the fixing of the hinged support 43 of the seat S. A fin 43A of support 43 engages a rod 45 to which are connected a hinge 47 for seat S and a hinge 49 for cover C. Seat S is provided with a continuous upper portion S1 and two lower portions S2 and S3, which are connected to portion S1 and form a substantially continuous bearing on the edge of the pan, except for two housings A for the suction apertures. Each support 43 has a cavity 43B which is forwardly open to form the relevant suction aperture. Each support 43 forming the aperture 43B is housed in a relevant housing A within seat S (formed by portions S1, S2, S3). The supports 43 bear on edge Vo of pan V with the interposition of gaskets which are shaped according to the edges of supports 43, with a forward transverse portion S1A. Within cavity 43B of each support 43 there are provided two opposed edges 43D, which engage a cross-piece 53 which can be moved along said edges. The threaded rod 41 can be moved along a longitudinal slot in the cross-piece 53. Thus, each rod 41 can be positioned with a large amount of play along two perpendicular directions, in order to offer a possibility of adaptation to the holes F of the edge Vo of pan V.

Under edge Vo the gaskets 55 of two sleeves 57 are applied. Each sleeve is provided with a respective cross-piece which has respective longitudinal slots. The respective rod 41 passes through each slot. Ring nuts 59 can be screwed on the sleeves 57 for coupling to flexible ducts 61 for the connection to the suction unit and to the filtration unit, if provided for.

The suction unit 210 comprises a case 212 wherein the motor with fan 214 is housed. 216 denotes a deodorizing filter; 212A denotes a cover which closes the case 212. In the case 212 there is housed also an electronic card 218. A proximity sensor (which can be formed by the paint of seat S) transmits the signals through metallic members 49, 45, 43, 53, 41, 57, a metallic ring 59 of the nut and a metallic conductor combined to duct 61, to the card 218.

Claims

1) A device for the elimination of unpleasant odors from the pans of water-closets, comprising means for the suction of the unpleasant odors directly from the water-closet bowl, and means for the elimination of the unpleasant odors through a special filter or by conveying them to the outside.

2) The device as in the preceding claim, compris-

ing means for direct conveying into the water-closet waste pipe.

3) The device as in claim 1 or 2, in which, to prevent the dispersion of the unpleasant odors in the environment, suction apertures are provided and are disposed for suction from the interior of the bowl or pan of the water-closet, this interior being suitably bounded by seals or other devices between the seat and the edge of the pan.

4) The device as in one or more of claims 1 through 3, in which the aperture or apertures are provided directly in the porcelain of the pan.

5) The device as in one or more of claims 1 through 3, in which the aperture or apertures are provided inside the seat.

6) The device as in one or more of claims 1 through 3, in which the aperture or apertures are located so that they rest on the upper edge of the pan, between the pan and the seat.

7) The device as in one or more of claims 1 through 3, in which the aperture or apertures are integral in the hinged supports of the said seat.

8) The device as in claim 7, in which the apertures are formed with hollow elements which act in combination with the surface of the pan.

9) The device as in claims 7 and 8, in which suction is provided through the attachment holes of the supports.

10) The device as in claim 9, in which each of the threaded rods provided for mounting the supports is engaged along a slot of a cross-piece which is slidably mounted in the hollow element and is slidable along a slot in a sleeve placed underneath and provided for connection with a suction duct.

11) The device as in one or more of the preceding claims which includes an external filtration or discharge unit.

12) The device as in one or more of the preceding claims which also includes an apparatus for detection of active masses, particularly persons, with one or more sensors, which may be selected from proximity sensors of the radar, ultrasonic, micro-wave, infrared, gravity or other type.

13) The device as in claim 12, wherein a sensor is provided by an inductive paint of the seat or cover.

Fig. 1

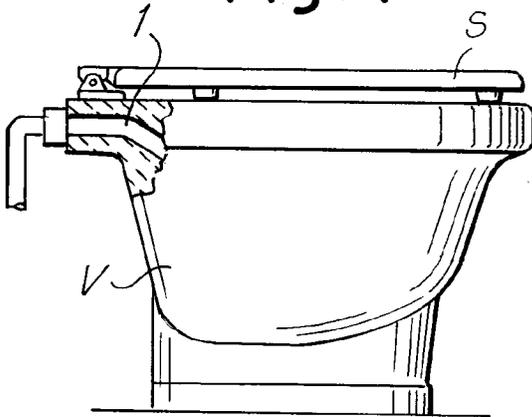


Fig. 3

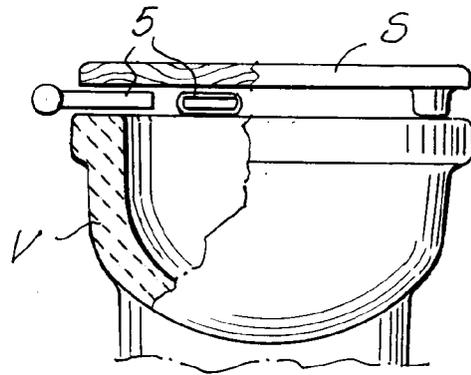


Fig. 2

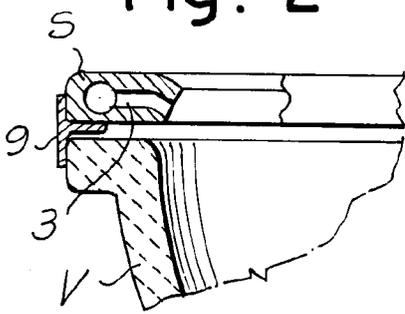


Fig. 4

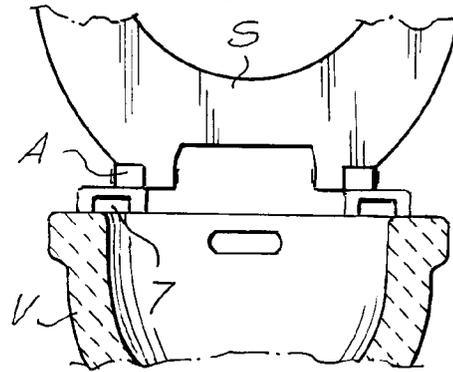


Fig. 5

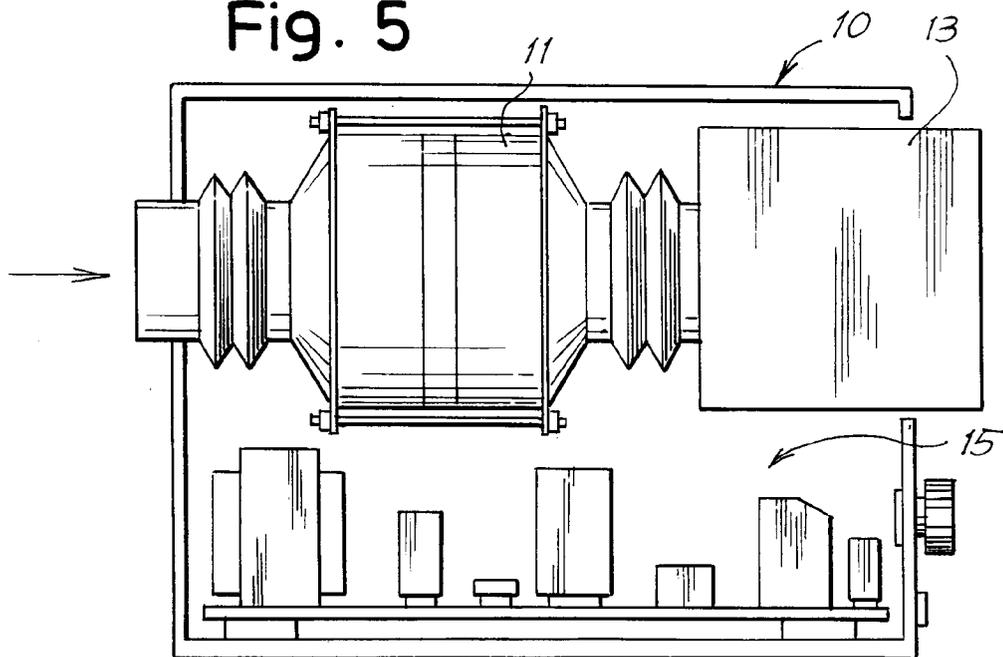


Fig. 6

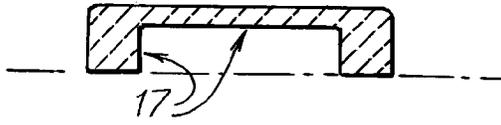


Fig. 7

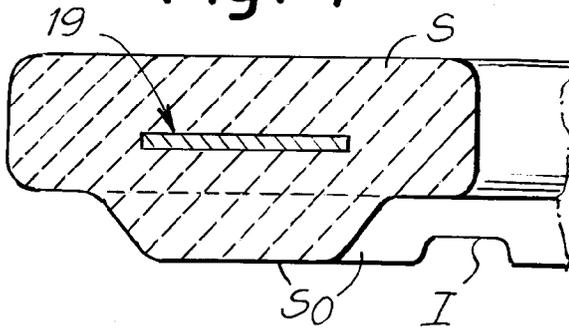


Fig. 8

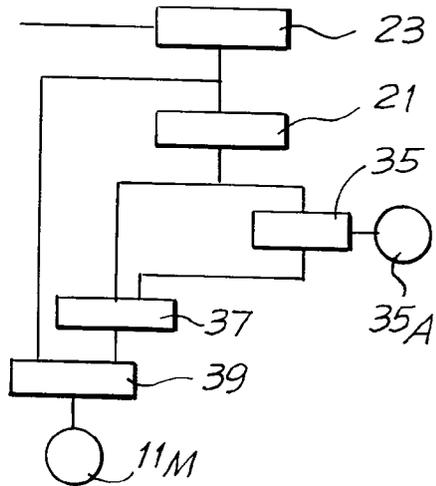


Fig. 9

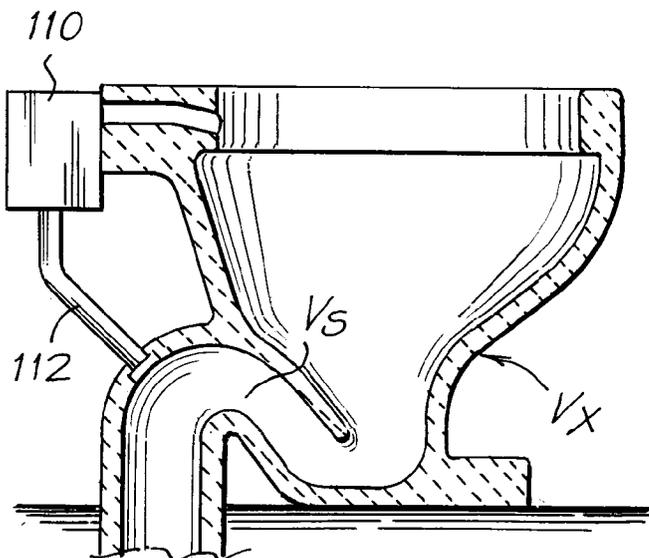
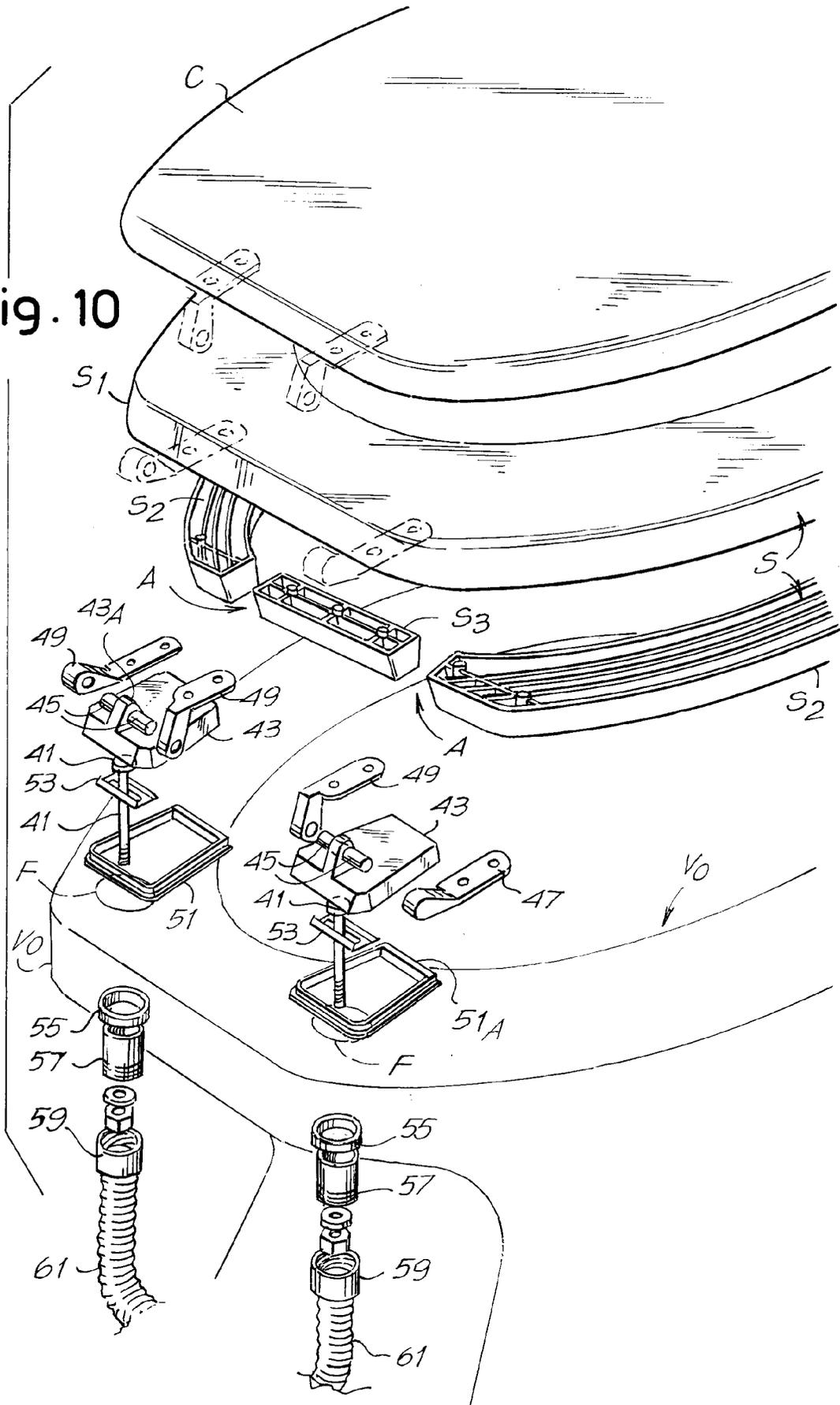


Fig. 10



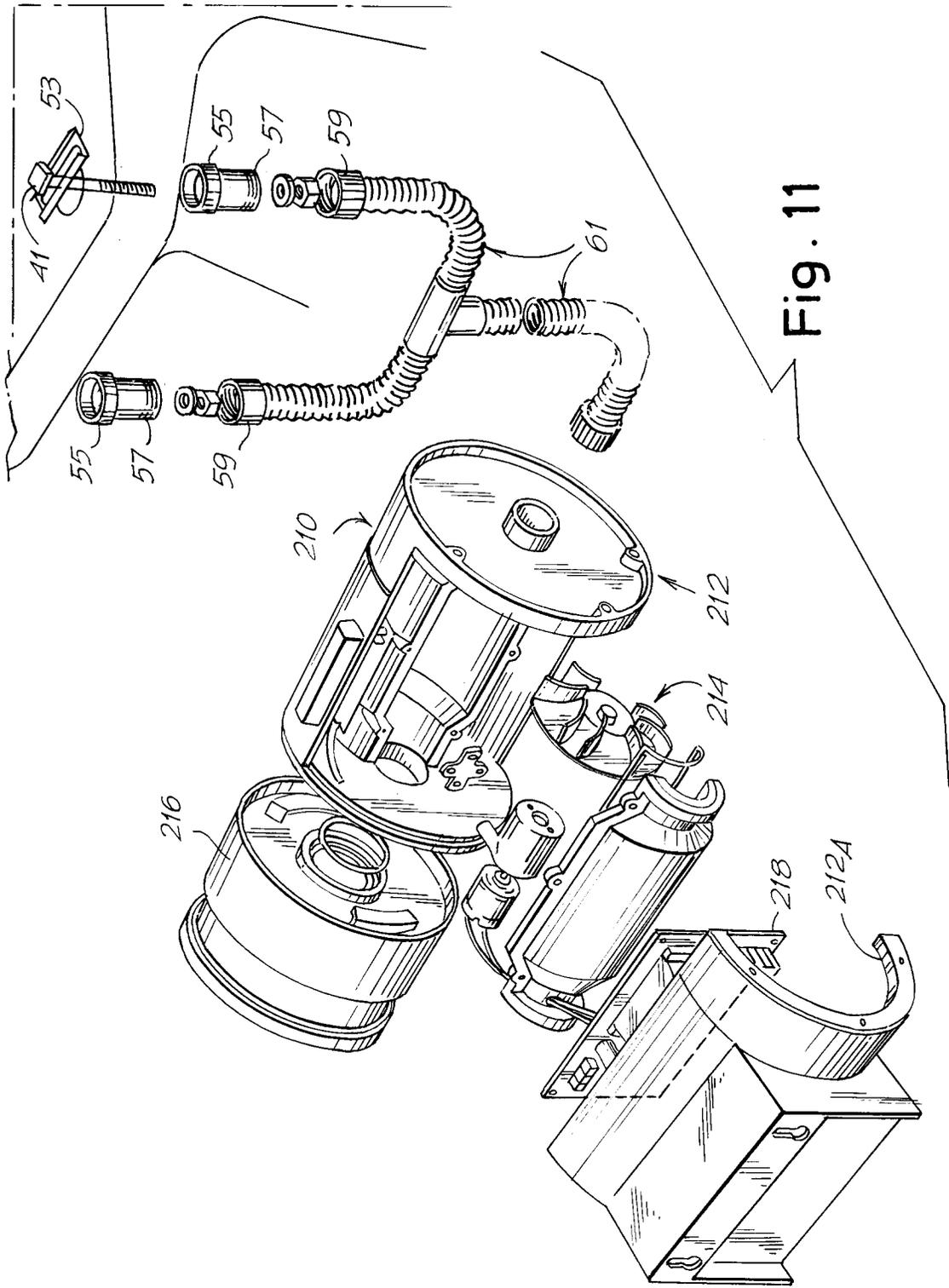


Fig. 11

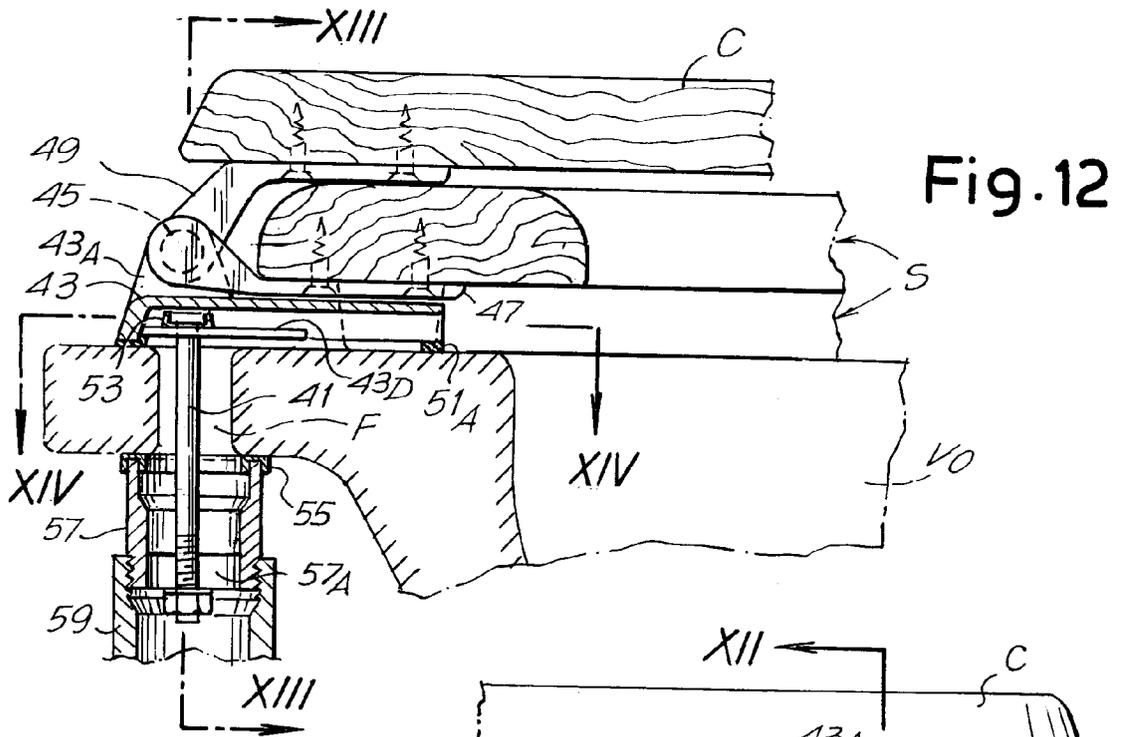


Fig. 13

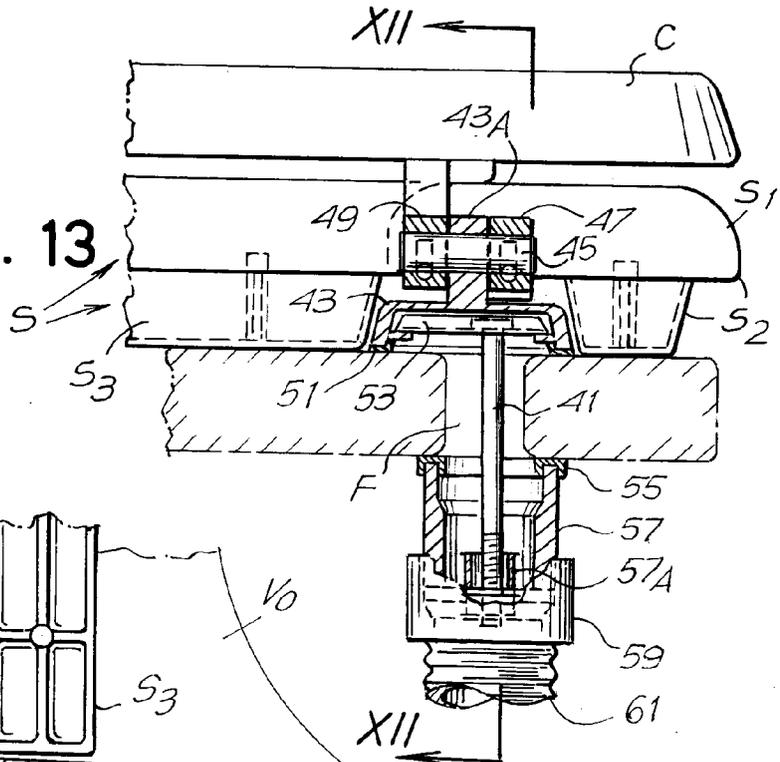
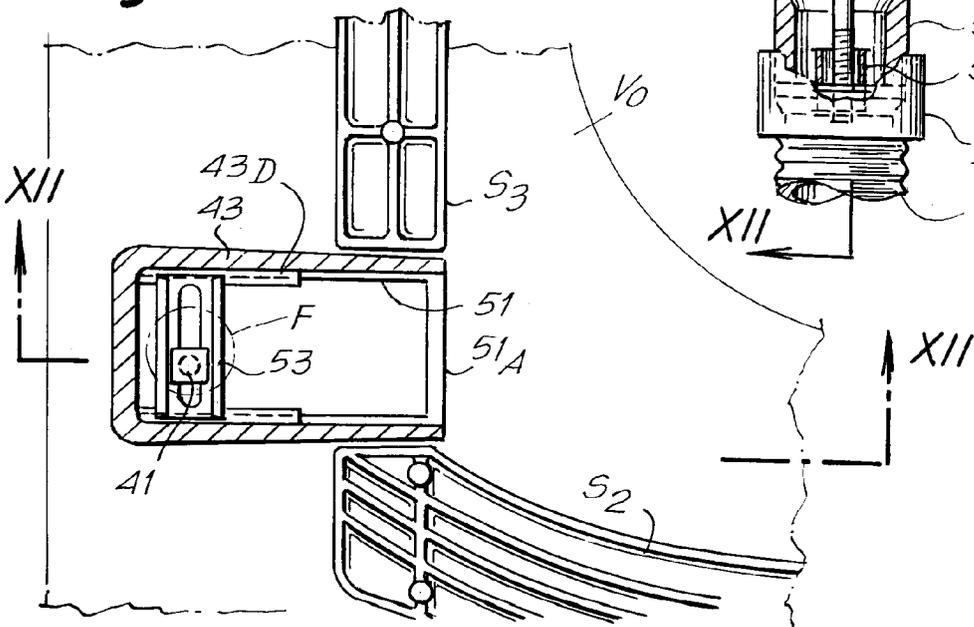


Fig. 14





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EUROPEAN SEARCH REPORT

Application Number

EP 92 83 0025

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 Y	GB-A-2 143 872 (BILLING) * the whole document * ---	1, 3, 5, 11 9	E03D9/05
X Y A	US-A-2 527 110 (WHEELER) * figures * ---	1, 6, 7, 8 9 10	
X	US-A-3 849 808 (OLSON ET AL) * column 3, line 5 - line 24; figures * ---	1, 6, 11, 12	
X	GB-A-1 134 095 (LEVITT ET AL) * figures * ---	1, 2, 6	
X A	US-A-4 620 329 (WIX) * the whole document * ---	1, 5, 12 9, 11	
X A	FR-A-2 135 812 (MINGUZZI) * claims; figures * ---	1, 2, 4, 6, 11 7-9	
A	US-A-3 887 949 (OSMOND) -----		TECHNICAL FIELDS SEARCHED (Int. Cl.5) E03D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 02 APRIL 1993	Examiner VAN BEURDEN J.J.C.A
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