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I-00187 Roma(IT)(54) **Water closet, particularly apted for vehicles.**

(57) A water-closet, particularly apted for vehicles, composed of two basic parts, i.e. a seat (1) with a tank or basin (3) for collecting the sewage and a base (2) with reinforcing means (9, 11) and complementary parts constituted by a support (4) and a reservoir (20) received within said support, the base (2) being internally provided: on the rear side, with a reinforcing rib (9) and a coupling (10) for a venting or exhalation piping, towards the front, with a wall or rib (11), having a curved outline, apted to delimit a space to receive a flexible tube for feeding water to the shower (13) which exits from the housing (8) of the seat, and with a flange (7) for connecting the exhaust pipe (6) of the tank (3) with the true and proper exhaust, two small doors (15, 16) placed on the sides of the base (2) permitting the access inside the base (2) for the installation and servicing, at least one of the small doors acting also as a toilet-paper roll-holder (16). The support (4), open at the bottom, is provided with holes (18) corresponding with the holes (14) of the base, and with a hole apted to receive in a sealed condition the exhaust pipe coming from the flange (7), on its rear wall two vertical channels (17) being provided, apted to receive the venting or exhalation pipe (10) and the pipe (12) feeding the water to the shower. The support (4) receives a tank or reservoir (20), internally provided with small supporting columns (22), some suitable holes, which are only marked, permit-

ting to connect, through a valve (24) the tank (20) with another reservoir placed below the platform of the vehicle, or directly with a culvert.

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"Water closet, particularly apted for vehicles"

It is known that in the vehicles, both terrestrial and of the marine and aerial type, intended for transportation, and also for housing, of persons, it is useful or sometimes absolutely necessary to install a water-closet to be utilized both with a stationary and a moving vehicle.

Apart from the consideration of the room, always very scarce, available in said vehicles, it is to be kept in mind that the sewage cannot be freely exhausted outside, but must be collected in tanks which successively are discharged into the suitable places of collection and digestion.

It is also known the ever increasing employment of synthetic resins in the realization of sanitary equipments owing to the known qualities of lightness, unassailableness, absence of porosity and so on.

It is, however, to be pointed out that the sanitary equipment, generally speaking, and the water-closets in particular, are subjected to loads which may be very high and to stresses which are variable owing to the operating conditions.

It is, therefore, very felt the need of improvements in the water-closets, which would simplify their manufacturing and installation, and in the same time would render them more efficient, thus achieving economical and practical advantages.

The water-closet according to the invention, completely made preferably of ABS, is substantially constituted by two basic parts, to which other complementary parts may be added.

The two basic parts are a seat with a basin for the momentary collection of the sewage, provide with an exhaust opening, and a base, provided with a connection between the basin and the exhaust, receiving at its inside the said basin.

The complementary parts (complementary since they can be substituted by other parts of a different type) are a seat-cover, a support for achieving the desired height for the two basic parts, and a recovery reservoir which can be housed within the said support.

For the present invention, characteristic are the means foreseen to strengthen the various parts, as well as the distribution of the available room in order to receive the accessory services and to assemble the various parts with each other and together with the vehicle.

The invention will be now described in one of its preferred embodiments with reference to the enclosed indicative drawings, wherein:

Figures 1 and 2 show, according to an isometric view from outside, respectively with lowered and raised seat-cover, the seat with the collecting tank and the base which supports the seat and receives the tank itself;

the Figures 3 and 4 are views similar to the preceding ones, with the true and proper water-closet installed on a support

Fig. 5 shows, according to an isometric view, the seat with the tank;

Fig. 6 shows, according to an isometric view, the inside of the base of the water-closet of the invention;

Fig. 7 shows, according to an isometric view, the seat-cover;

Fig. 8 shows, according to an isometric view, the complementary element acting as a support or container;

Fig. 9 shows according to an isometric view, the recovery tank which can be housed within the support of Fig. 8;

Figures 10 and 11 show, according to isometric views, two types of small doors which may be applied on the sides of the base of the Figures 1 and 2;

Fig. 12 shows the water-closet mounted upon its support seen in elevation from behind;

Figures 13, 14 and 15 show in a view from above the seat with the tank, the base and the support, with the corresponding supplementary reservoir, respectively of Figures 5, 6 and 8-9;

Figures 16 and 17 show two possible lay-outs for mounting the water-closet of the invention.

With reference to said drawings and as it appears from the Figures 1 to 4, the water-closet of the inventions formed of two basic parts, that is of a seat 1, provided with a collecting basin 3, and a base 2, upon which the seat 1 is applied and which receives inside it the basin 3. Below the base 2, a supporting element 4 is foreseen which has the main function of bringing the seat 1 and the base 2 to the height which is necessary with respect to the resting plane. The seat 1 may be covered by a seat-cover 5 which is suitably ribbed in order to increase its strength and is provided with side traces or prints 6 in order to facilitate its opening.

As it is better seen in the Figures 5 and 13, the basin 3, preferably integral with the seat 1, is provided with an exhaust hole 6 for the sewage, this hole, through a suitable connecting flange 7, communicating with the exhaust true and proper, which starts from the base 2 of the water-closet, as it will be better seen in the following. The seat 1 is completed by housings 8 for a tank-cleaning's shower.

The base 2 (see in particular Figures 6 and 14) which receives on its upper rim the seat 1, has inside itself, on the back side, a support and/or a strengthening rib 9 and a coupling 10 for a venting or exhalation pipe and, arranged towards the front, a wall or rib 11, having a curved outline, whose purpose is to rib and support the seat 1 and to receive the flexible 12 piping feeding water to the shower 13 which exits from the housing 8 of the seat. In the rest position of the shower 13, the flexible piping 12 takes, inside the base 2, the position which is illustrated by dash lines in the Fig. 14, whereas, when the shower 13 is in the extracted position, the flexible piping 12 takes the position which is indicated by full lines. In this way one has the possibility to house the shower in such a way that it will give no trouble during the non-use periods, and in the same time one gets a suitable protection for the water-feeding pipe.

As said, the base 2, preferably near the strengthening rib 9, is provided with a flange 7 connecting the exhaust pipe of the basin 3 with the true and proper exhaust, both if this happens through an internal tank and an external tank, as it will be more clearly explained in the following. Furthermore, the base 2 is provided with holes 14 permitting the passage of members for fixing said base to a support, for instance the support 4.

In order to gain the access to the fixing members of the base 2 and of the flange 7, on the sides of the base 2 two small doors 15 are foreseen, and respectively 16, which permit the access to the inside of the base 2 and one at least of which, for instance the door 16, shown in the Fig. 10, acts also to hold a toilet-paper roll. These small doors are fixable in any way to the base 2, preferably hinged at the sides and, as said, have the purpose to permit the access to the inside of the base for the mounting and servicing operations.

The seat 1 and the base 2, in the whole, reach an height from ground which is lesser than that which is normal and useful. It is, therefore, necessary to provide a support able to bring to the right height the seat's plane. To this purpose, apart from the possible utilization of other supports, the invention foresees a support which presents particular advantages. This support, generally indicated by 4 in the drawing, open at the bottom, apart from being superiorly provided with holes 18 corresponding to the holes 14 of the base 2, and with a hole apted to receive in a sealing way the exhaust piping from the flange 7, is externally provided, at the periphery of its base, with holes 19 for the passage of fixing members for the support to the floor. Furthermore, on its back portion, two vertical channels 17 are foreseen, which are apted to receive one of them the venting or exhalation pipe 10 and the other one the piping 12 feeding water to

the shower. The support 4 is completed by a tank 20 housed in its inside, provided in its turn, on the upper portion, with assembling holes 25 intended to unite the base 2, the support 4 and the tank 20, and provided internally with small columns 22 which constitute supporting pillars of the upper wall of the support 4, and therefore of the lower wall of the base 2 and, in substance, of the seat 1. These small columns 22 cooperate, that is, to strengthen the whole of the water-closet. Furthermore, the bottom 21 the back wall of the tank 20 are foreseen with "marks" 23 which, when they are open, permit to connect the tank 20 itself with a reservoir placed under the platform of the vehicle, after the passage of the sewage through it, or directly with a culvert, as shown in the Figures 16 and respectively 17. In every case, a valve 24, operable from inside the vehicle or from the outside of it, will permit the communication or the intercepting of the exhaust from the water-closet according to the need.

From the foregoing description, the characteristics and advantages offered by the water-closet according to the invention appear to be evident. In effects, the sanitary apparatus may be made of any apted synthetic resin, with thicknesses reduced to the minimum and with the most various manufacturing processes, always keeping characteristics of strength that uptodate have been never reached. Its installation is extremely simple, since it may be effected by the successive assembling and mounting of the various parts, and by the exploitation of the small doors 15, 16 for fixing the exhaust of the collecting tank 3 with the exhaust which is foreseen ahead of the base. Furthermore, the adoption of an internal reservoir does remarkably increase the capacity of the sewage's tank and constitutes a stand-by for emergency situations.

The water-closet according to the invention has been described and illustrated by way only of a non-limitative example. Within the scope of the technical equivalences, variants and modifications can be made within the scope of the appended Claims.

Claims

1. A water-closet, particularly apted for vehicles, characterized by that it is constituted by two basic parts and by complementary parts, the basic parts being a seat (1) with a collecting tank (3) for the sewage and a base (2) with strengthening means (9, 11).

2. A water-closet particularly apted for vehicles, according to Claim 1, characterized by that the complementary parts are constituted by a support (4) and a reservoir (20) received within said support, the base (2) of the Claim 1 being apted to be

tied to the upper wall of the support (4), the last-named member being apted to be tied from the outside to the floor or resting surface through the holes (19).

3. A water-closet, particularly apted for vehicles, according to Claim 1, characterized by that the base (2) is internally provided, on its back side, with a strengthening rib (9) and with a coupling - (10) for a venting or exhalation piping, and, towards the front, with a wall or rib (11), having a curved outline, which, apart from the fact of acting as a support for the seat (1), delimits a space to receive a flexible (12) intended to feed water to the shower (13), which exits from the housing (8) of the seat - (1).

4. A water-closet, particularly apted for vehicles, according to Claim 1, characterized by that the base (2), preferably near the strengthening rib - (9), presents a flange (7) intended to connect the exhaust piping (6) of the tank (3) with the true and proper exhaust.

5. A water-closet, particularly apted for vehicles, according to Claim 1, characterized by that at the sides of the base (2) two small doors (15) and respectively (16) are foreseen, which permit

the access to the inside of the base (2) for the installation and servicing, at least one of the small doors (16) acting also a toilet-paper-roll holder.

6. A water-closet, particularly apted for vehicles, according to Claim 2, characterized by that the support (4) is open at the bottom, whereas it is superiorly provided with holes (18) corresponding with the holes (14) of the base and (25) of the tank, and with a hole apted to receive sealingly the exhaust piping from the flange (7), on its back wall two vertical channels (17) being foreseen, which are apted to receive the venting or exhalation piping (10) and the pipe (12) intended to feed the water to the shower (13).

7. A water-closet, particularly apted for vehicles, according to Claim 2, characterized by that the support (4) is completed by a reservoir (20), housed within its inside, and provided with small columns (22) having a strengthening function, suitable holes, only marked, permitting to connect the reservoir (20) with another reservoir placed below the platform of the vehicle, or directly with a culvert, a valve (24) allowing the communication or the intercepting of the exhaust from the water-closet, according to the need.

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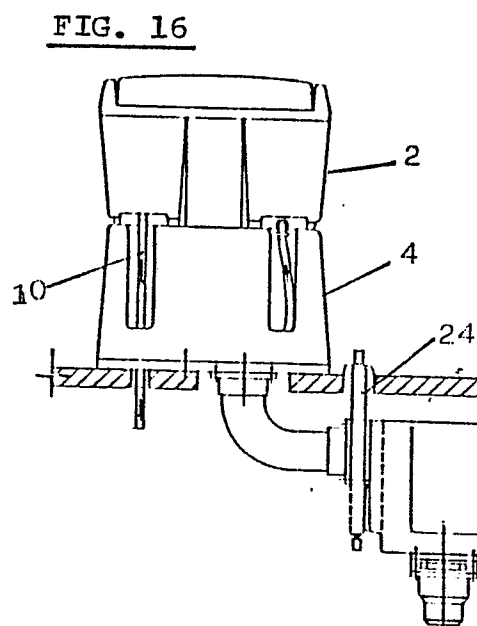
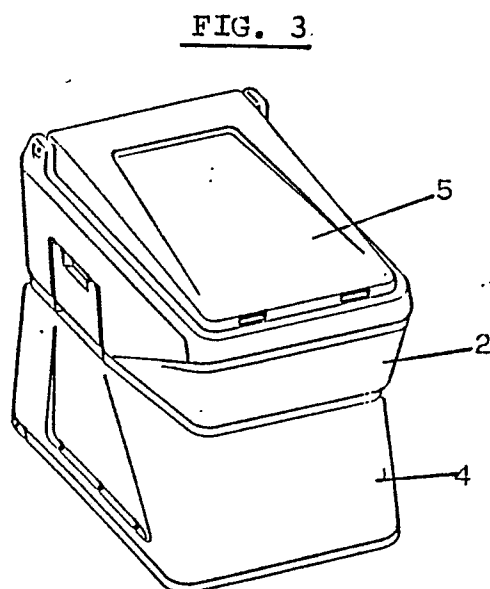
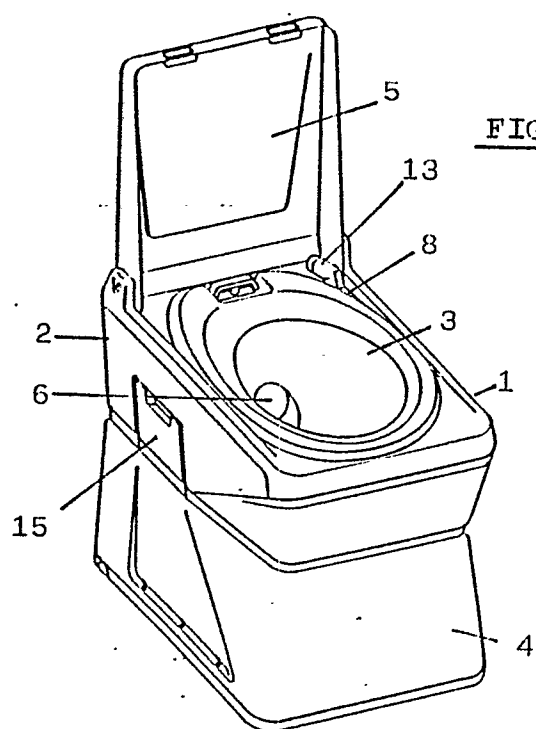
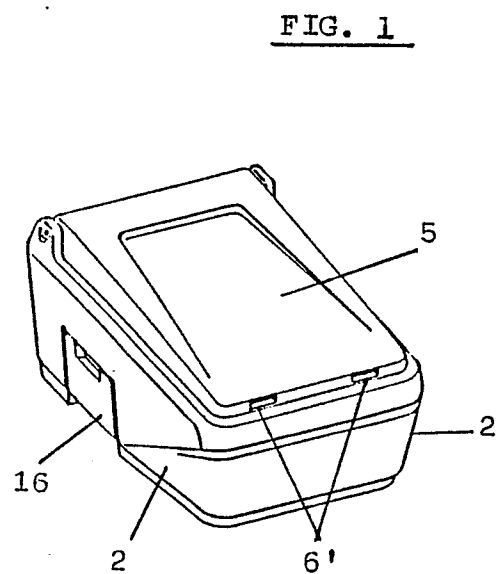
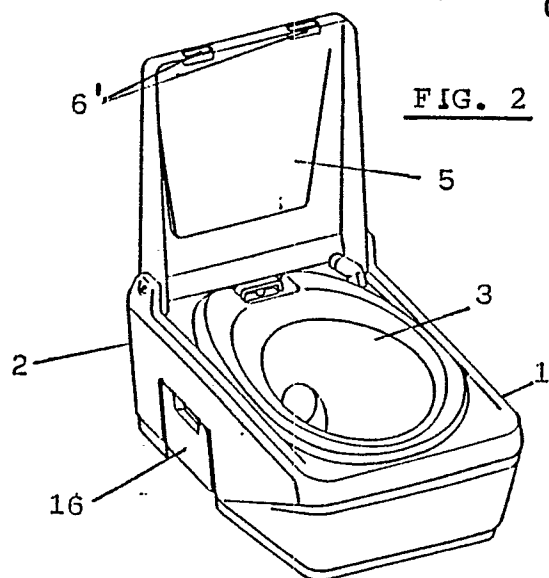


FIG. 17

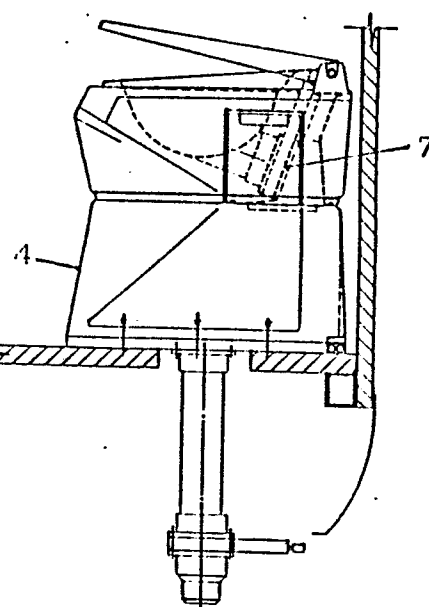


FIG. 5

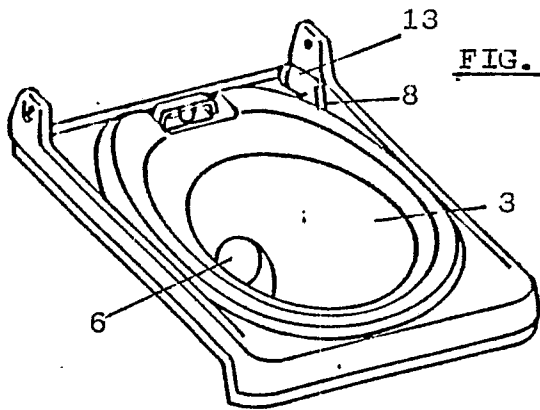


FIG. 7

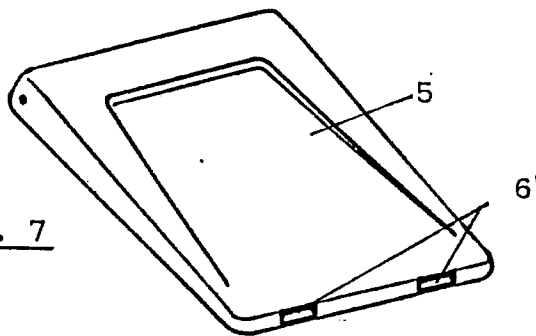


FIG. 6

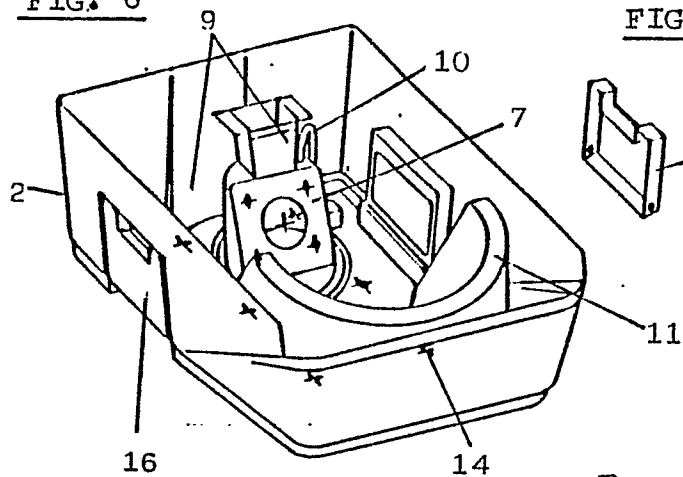


FIG. 11

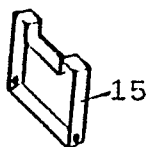


FIG. 12

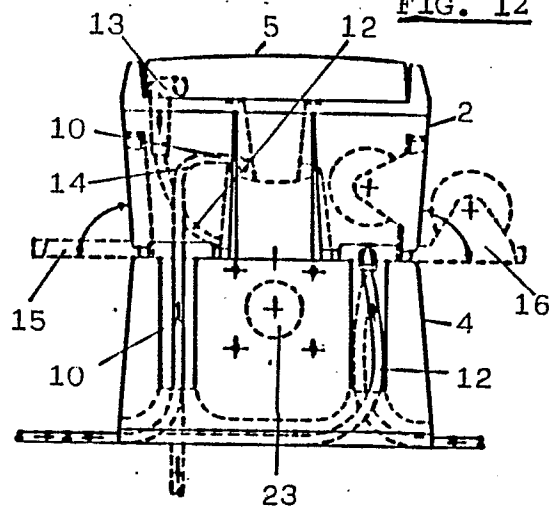


FIG. 13

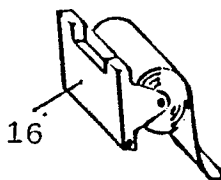
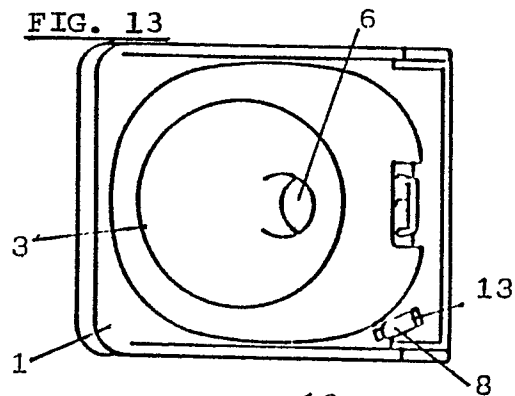


FIG. 10

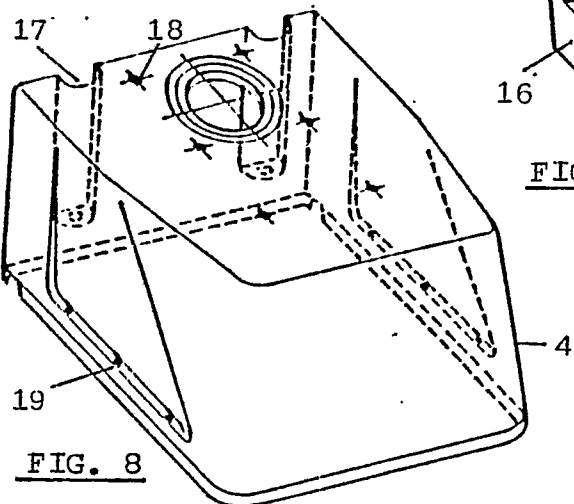


FIG. 8

FIG. 14

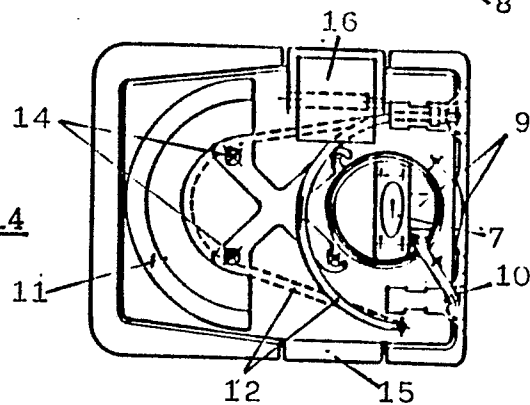


FIG. 9

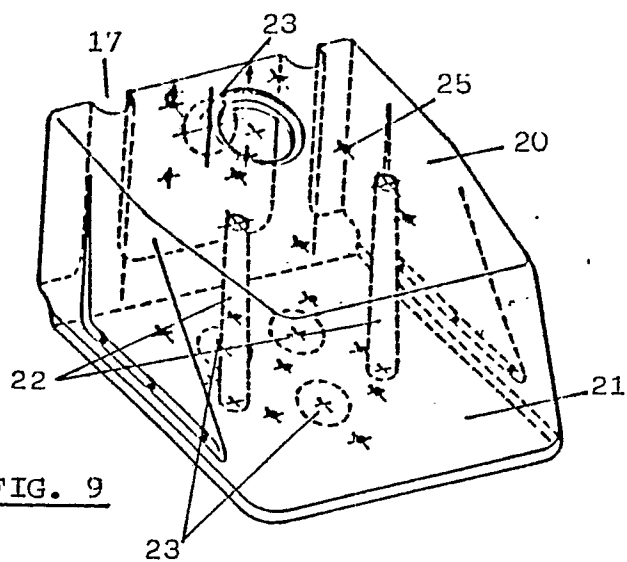


FIG. 15

