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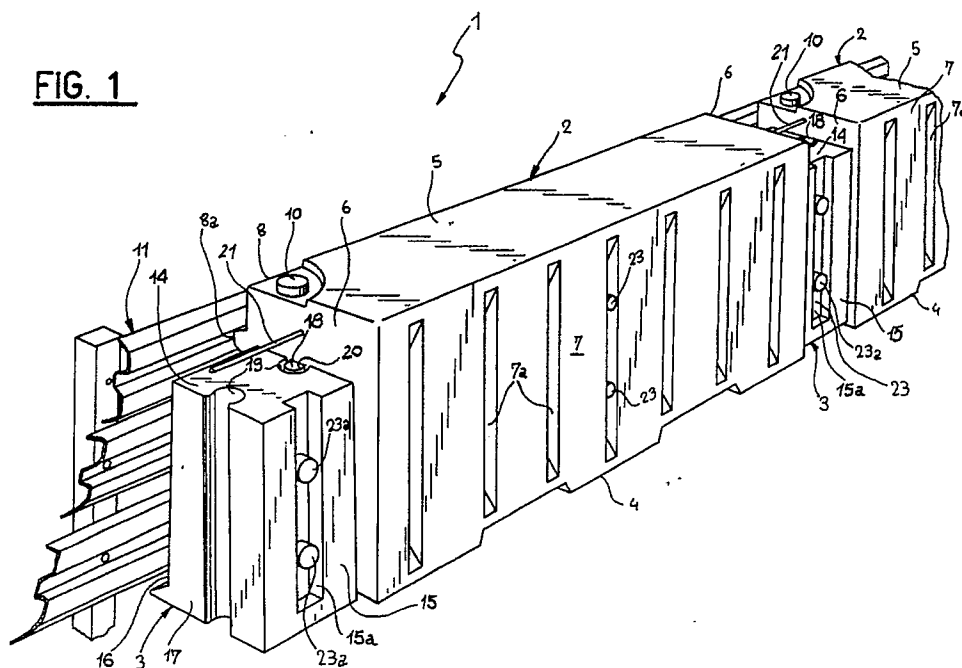
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54 **Shock-absorbing barrier for road uses.**

57 The shock-absorbing barrier (1) made of plastic material comprises a number of main bodies (2) consecutively interconnected in mutual alignment relationship and exhibiting each a substantially parallelepiped and horizontally elongated configuration. Each main body (2) consists of a base wall (4), a top wall (5), two side walls (6) each at either end of the main body, a front wall (7) exhibiting a plurality of

absorption recesses (7a) extending in a substantially vertical direction over the whole height of the front wall and a rear wall (8) provided with a plurality of longitudinal parallel ribs (8a) and having a sectional profile matching the shape of a guard-rail (11) against which the barrier (1) is located in abutment. Each main body (1) is hollow at the inside to be filled with a liquid or other filling material.

FIG. 1



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The present invention relates to a shock-absorbing barrier for road uses comprising a number of main bodies consecutively interconnected in mutual alignment relationship and exhibiting each a horizontally elongated configuration.

It is known that there are on the market modular elements made of plastic material which are internally hollow so that they can be easily carried and subsequently filled with water, after the setting up. These modular elements are connectable to one another after optionally inserting additional connecting elements between them, in order to create partition barriers of any desired length.

These barriers are set up for example on the occasion of upkeeping works on the roadway for the purpose of diverting the vehicle way or at all events temporarily bounding areas or routes for any reason.

Modular elements that have been so far used for the accomplishment of said barriers, besides being hollow at the inside, have a substantially elongated configuration in a horizontal direction, comprising a base portion having upright walls, an intermediate portion of upwardly-converging inclined walls and a top portion exhibiting upright walls too.

However modular elements of the above type have been found to give rise to some problems as regards safety.

In fact the inclined walls in the intermediate portion of the modular element become a sort of springboard helping in lifting and overturning the vehicle when the latter bumps against the barrier according to a given angular inclination.

It is also to be pointed out that these barriers cannot be used as additional protection elements in association with the protection barriers already existing on the road such as guard-rails, walls and the like for example.

In fact, since these modular elements substantially have an upwardly narrowing shape, the narrowing being symmetrical and rather marked, each of them will be located so as to have its base portion in abutment against the guard-rail, whereas the top portion will be greatly spaced apart from the guard-rail itself.

In case of shock, the modular element would be therefore prone to overturn about its base side adjacent the guard-rail, suddenly losing most of its shock-absorbing capability.

On the contrary, a protective barrier adapted to be associated with a guard-rail and consisting of hollow bodies partly filled with water would be particularly desirable for example when car or motorcycle racing circuits or routes have to be arranged, either along roads normally assigned to public circulation or tracks specifically arranged for said races.

It is an object of the present invention to provide a shock-absorbing barrier which lends itself to be associated with an already existing protective barrier, such as a guard-rail, wall or the like, in order to increase its shock-absorbing capability to a great extent. For the purpose it is important that the shock-absorbing barrier, besides having excellent properties in absorbing shocks, be shaped in such a manner that from the interaction thereof with the associated guard-rail or other protective barrier already installed, a synergistic implementation effect of the protective function may arise.

Another important object of the invention is to provide a barrier that, even if set up separately from the already existing protective barriers, offers a greater absorption capability and, as a whole, improved safety qualities as compared with prior art barriers.

The foregoing and further objects that will become more apparent in the course of the present description are substantially attained by a shock-absorbing barrier for road uses made of plastic material and comprising a number of main bodies consecutively interconnected in mutual alignment relationship and exhibiting each, in a horizontally elongated configuration, a base wall, a top wall extending above the base wall, two side walls extending between the base and top walls at either end of the main body, a front wall extending between the base wall, top wall and side walls, and a rear wall parallelly spaced apart from the front wall and extending between the base wall, top wall and side walls, characterized in that each of said main bodies exhibits a substantially parallelepiped configuration and is provided with a number of absorption recesses extending substantially in a vertical direction over the whole height of the front wall and a number of longitudinal ribs parallel to each other and extending over the rear wall.

Further features and advantages will become more apparent from the detailed description of a shock-absorbing barrier for road uses in accordance with the present invention, given hereinafter by way of non-limiting example with reference to the accompanying drawings, in which:

- Fig. 1 is a fragmentary perspective view showing a barrier in accordance with the invention set up adjacent a guard-rail;
- Fig. 2 is a fragmentary top view, partly in section, of the shock-absorbing barrier in accordance with the present invention;
- Fig. 3 is a sectional view taken along line III-III in Fig. 2;
- Fig. 4 is a sectional view taken along line IV-IV in Fig. 2.

Referring to the drawings and in particular to Figs. 1 and 2, a shock-absorbing barrier made of plastic material for road uses; in accordance with

the present invention has been generally identified by reference numeral 1.

The barrier 1 comprises a number of main bodies 2 consecutively interconnected in mutual alignment relationship and exhibiting each a horizontally elongated configuration. Preferably the interconnection between the various main bodies takes place with the aid of connecting bodies 3, each of them having a substantially parallelepiped and vertically elongated configuration. The connecting bodies 3 are each interposed between two contiguous main bodies 2.

Each main body 2 has a base wall 4, a top wall 5 extending above the base wall and two side walls 6 extending between the base wall 4 and top wall 5, and located at either end of the main body 2. A front wall 7 and a rear wall 8, parallelly spaced apart from the front wall, are defined between the base wall 4, top wall 5 and side walls 6.

The main body 2 is provided at the upper part thereof with at least an opening 9 optionally equipped with a removable plug 10 (Fig. 1) for filling the body with water, sand or other material adapted to increase the mass of the shock-absorbing barrier.

Advantageously and in accordance with the present invention, the front wall 7 is provided with a plurality of absorption recesses 7a extending in a vertical direction substantially over the whole height of the front wall 7 in order to impart a further margin of elasticity to the main body 2 before the latter yields to crushing after a shock. The absorption recesses 7a have a depth denoted by P in Fig. 3, the value of which preferably ranges between 1/5 and 1/3 of the thickness, denoted by S, of the barrier 1.

The rear wall 8 is provided with a plurality of longitudinal ribs 8a parallel to one another and insertable into grooves matching the shape of the ribs and exhibited by a guard-rail 11 (Fig. 3).

Along the rear wall 8 of the main body 2 a plurality of additional absorption recesses 12 can be provided; they are located opposite the recesses 7a of the front wall 7 and are substantially structured as the former.

The connecting body 3 has a base wall 13 and a top wall 14 as well as a front wall 15 and rear wall 16 extending substantially in vertical planes between the base wall 13 and top wall 14.

Each connecting body also has two side walls 17 extending in a substantially vertical direction between the base wall 13, top wall 14 and front and rear walls 15 and 16 respectively, each at either end of the connecting body 3.

The connecting body 3 as well is provided with at least an absorption recess 15a performing the same function as recesses 7a and 12 in the main body 2.

The main body 2 is linked to the connecting body 3 through a joining lug 18 extending upright along each side wall 6 of the main body 2 and adapted to be detachably fitted into an engagement seat 19.

Each seat 19 extends vertically along the side walls 17 of the connecting body 3 and its shape matches that of the joining lug 18.

Preferably the joining lug 18 is located in the middle of the side wall 6 and has a cylindrical configuration or at all events a configuration enabling it to be provided with at least an undercut 20 facing the side wall itself.

The main body is further linked in a longitudinal direction to the subsequent main body by a connecting rope 21.

Both the main body 2 and the connecting body 3 can be linked to a guard-rail 11 through connection means. The connection means comprises, for each main body 2, an anchoring rope 22 extending across the body itself and having, at one end thereof, a locking head 23 acting on the front wall 7 and, at the other end thereof, a threaded end element 24 engageable across the guard-rail 11 by means of a fastening nut 25. Likewise, for each connecting body 3, the connection means comprises an anchoring rope 22a extending across the body itself and having, at one end thereof, a locking head 23a acting on the front wall 15 opposite that in contact with the guard rail and, at the other end thereof, a threaded end element engageable across the guard-rail 11 by means of a fastening nut.

Alternatively, the main bodies 2 and connecting bodies 3 can be locked to the guard-rail 11 by a connection obtained by means of a rope passing through openings 26 and the opposite ends of which are fastened to the guard-rail and tied to each other.

The mode of use of the shock-absorbing barrier in accordance with the present invention appears very simple.

The shock-absorbing barrier 1 for road uses is set up by interconnecting the plurality of main bodies 2 and connecting bodies 3 one after the other in mutual alignment. More particularly, the various main bodies 2 are disposed in place on the roadway and they are linked to each other by means of the connecting bodies 2 by fitting the joining lugs into the corresponding engagement seats.

By virtue of the configuration of the connecting body 3, it is also possible to give the shock-absorbing barrier a curvilinear extension. Once they have been positioned, the main bodies can be filled with water or other filling material through the openings 9.

It will be recognized that the shock-absorbing

barrier being the object of the present invention is such conceived that it can absorb the shock of a motor-vehicle bumping against it, standing up to the collision with reaction forces of increasingly growing intensity.

For example in the case of a particularly violent collision, first an elastic and plastic deformation of the front wall 7 of the barrier occurs, followed by a compression of the air enclosed therein and a water raising.

When the inner pressure achieves a predetermined value, the plug 9 is ejected from its seat and the consequent raising and ejection of the water contained in the main body 2 causes a further gradual absorption of impact energy.

The next step in the barrier behaviour is determined by the deformation of the absorption recesses 12 in the rear wall 8 by effect of the thrust action exerted on said recesses by the recesses 7a present in the front wall 7.

At this point any residual impact energy is absorbed by the deformation of the guard-rail 11.

Obviously if the shock is of smaller intensity the barrier deformation for absorbing shocks will reach an intermediate stage among those described above.

The present invention attains the intended purposes.

In addition, due to the particular conformation of the side wall matching the shape of the guard-rail, the barrier becomes a unitary protection unit particularly adapted to be used in sports competitions.

Obviously many modifications and variations can be made to the invention as conceived, all of them falling within the scope of the inventive idea characterizing it.

Claims

1. A shock-absorbing barrier (1) for road uses made of plastic material and comprising a number of main bodies (2) consecutively interconnected in mutual alignment relationship and exhibiting each, in a horizontally elongated configuration:
 - a base wall (4);
 - a top wall (5) extending above the base wall (4);
 - two side walls (6) extending between the base (4) and top (5) walls at either end of the main body (2);
 - a front wall (7) extending between the base wall (4), top wall (5) and side walls (6); and
 - a rear wall (8) parallelly spaced apart from the front wall (7) and extending between the base wall (4), top wall (5) and

side walls (6),

characterized in that each of said main bodies (2) exhibits a substantially parallelepiped configuration and is provided with a number of absorption recesses (7a) extending substantially in a vertical direction over the whole height of the front wall (7) and a number of longitudinal ribs (8a) parallel to each other and extending over the rear wall (8).

2. A shock-absorbing barrier according to claim 1, characterized in that said absorption recesses (7a) have a depth the value of which ranges between 1/5 and 1/3 of the barrier thickness.
3. A shock-absorbing barrier according to claim 1, characterized in that said longitudinal ribs (8a) are insertable into grooves matching the shape of said ribs and offered by a guard-rail (11).
4. A shock-absorbing barrier according to claim 1, characterized in that it further comprises connection means to fixedly secure the main bodies (2) to the guard-rail (11).
5. A shock-absorbing barrier according to claim 4, characterized in that said connection means comprises, for each main body, an anchoring rope (22) extending across the main body (2) itself and having, at one end thereof, a locking head (23) acting on said front wall (7) and, at the other end thereof, a threaded end element (24) engageable across the guard-rail (11) by means of a fastening nut (25).
6. A shock-absorbing barrier according to claim 1, characterized in that each main body (2) is connected to the contiguous main body (2) through a connecting body (3) located intermediate two main bodies, said main body exhibiting, at each side wall (6) thereof, a joining jug (18) to be fitted into an engagement seat (19) offered by the connecting body (3).
7. A shock-absorbing barrier according to claim 6, characterized in that said connecting body (3) has connection means to fixedly secure said bodies to the guard-rail (11).
8. A shock-absorbing barrier according to claim 7,

characterized in that said connection means comprises, for each connecting body, an anchoring rope (22a) extending across the connecting body (3) itself and having, at one end thereof, a locking head (23a) acting on the front wall (15) opposite that in contact with the guard-rail (11) and, at the other end thereof, a threaded end element engageable across the guard-rail by means of a fastening nut.

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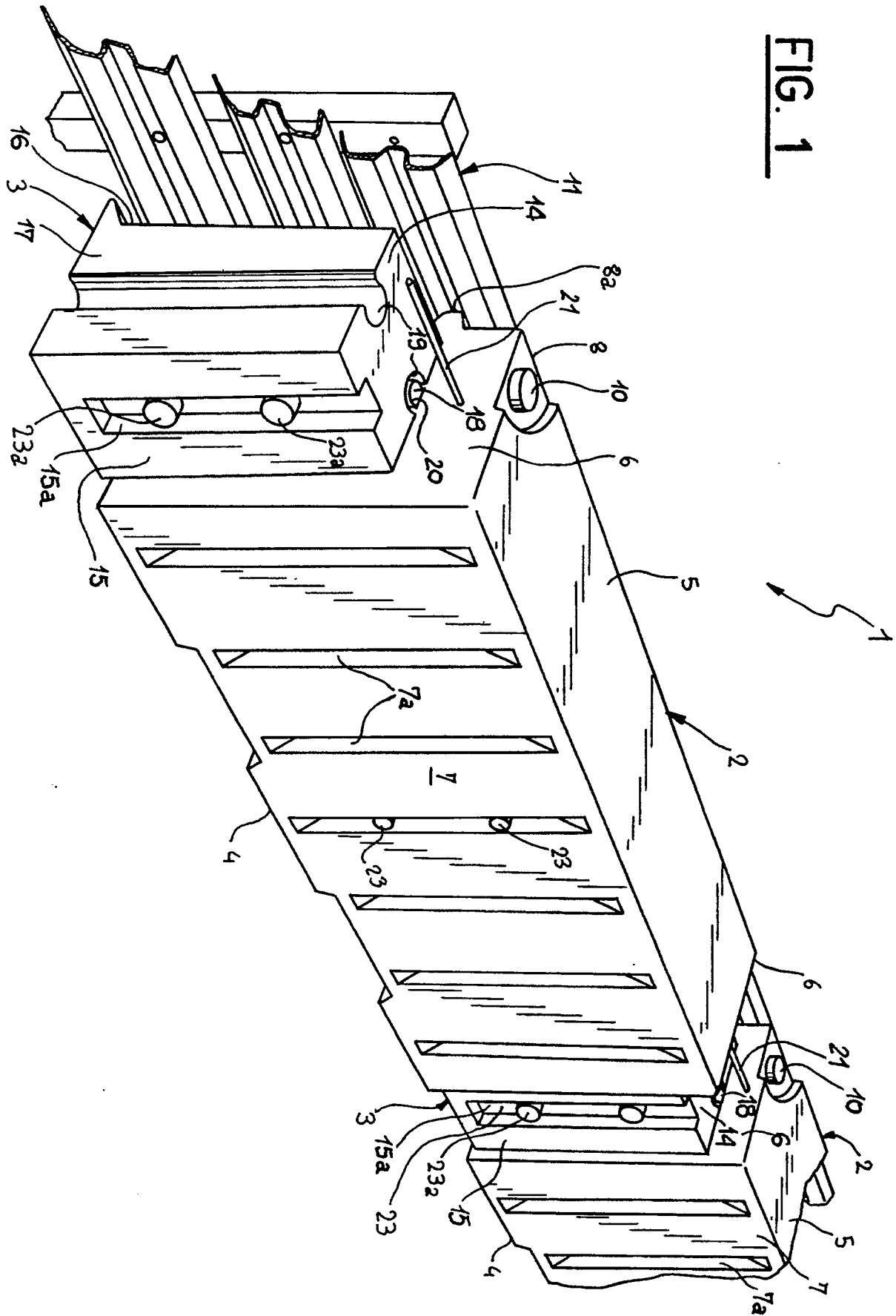
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FIG. 1



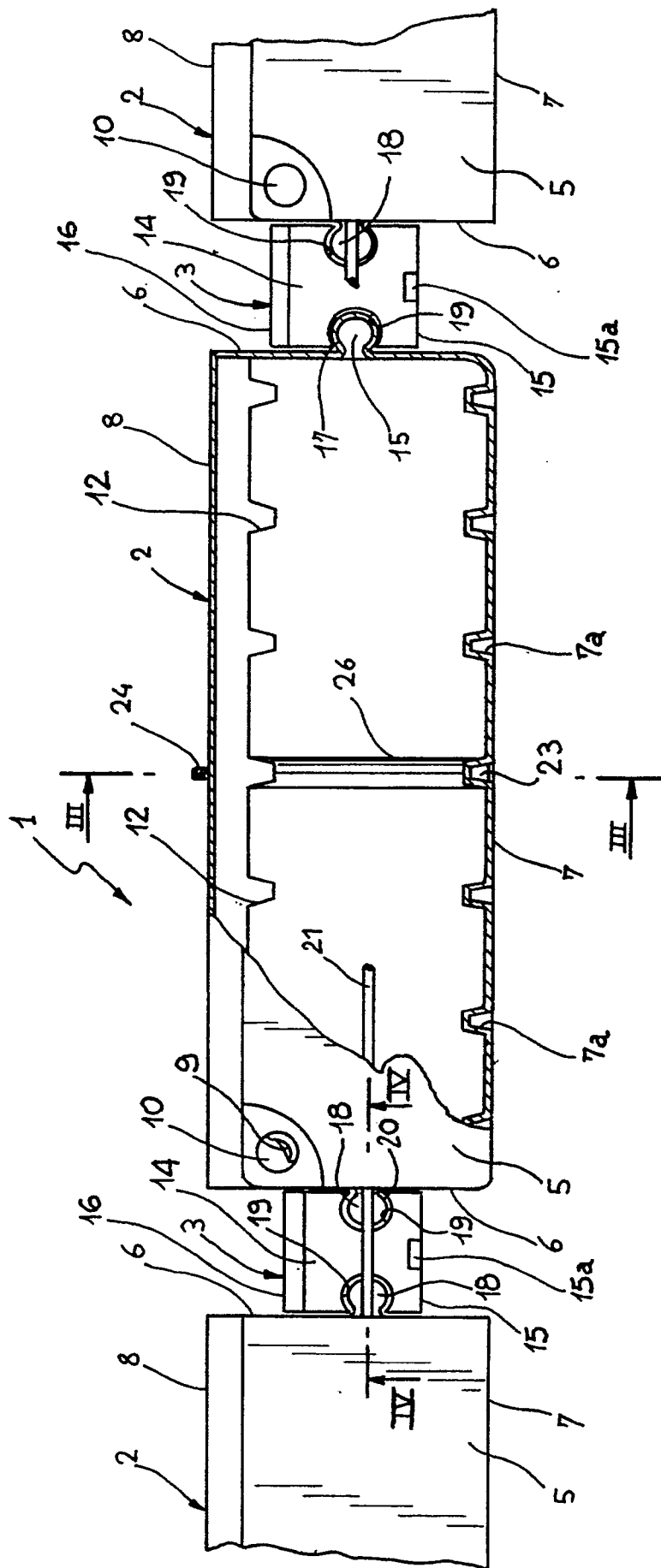
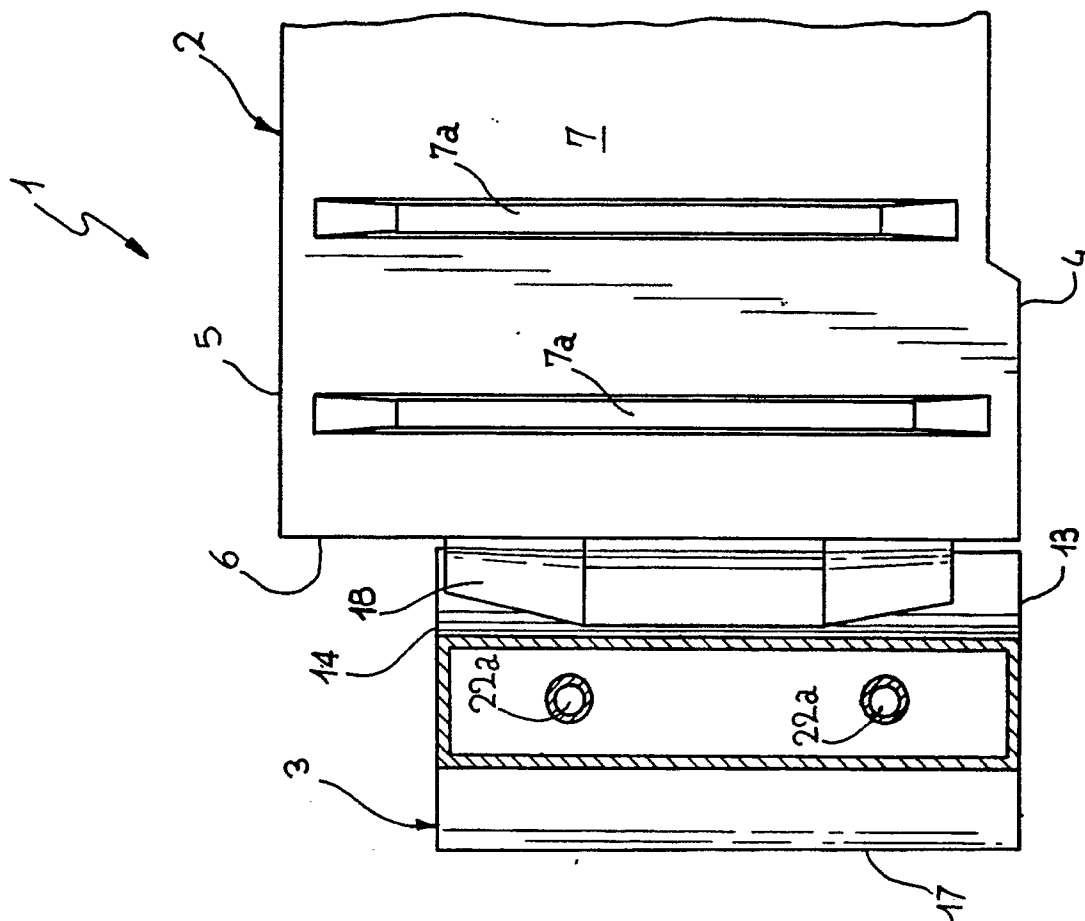
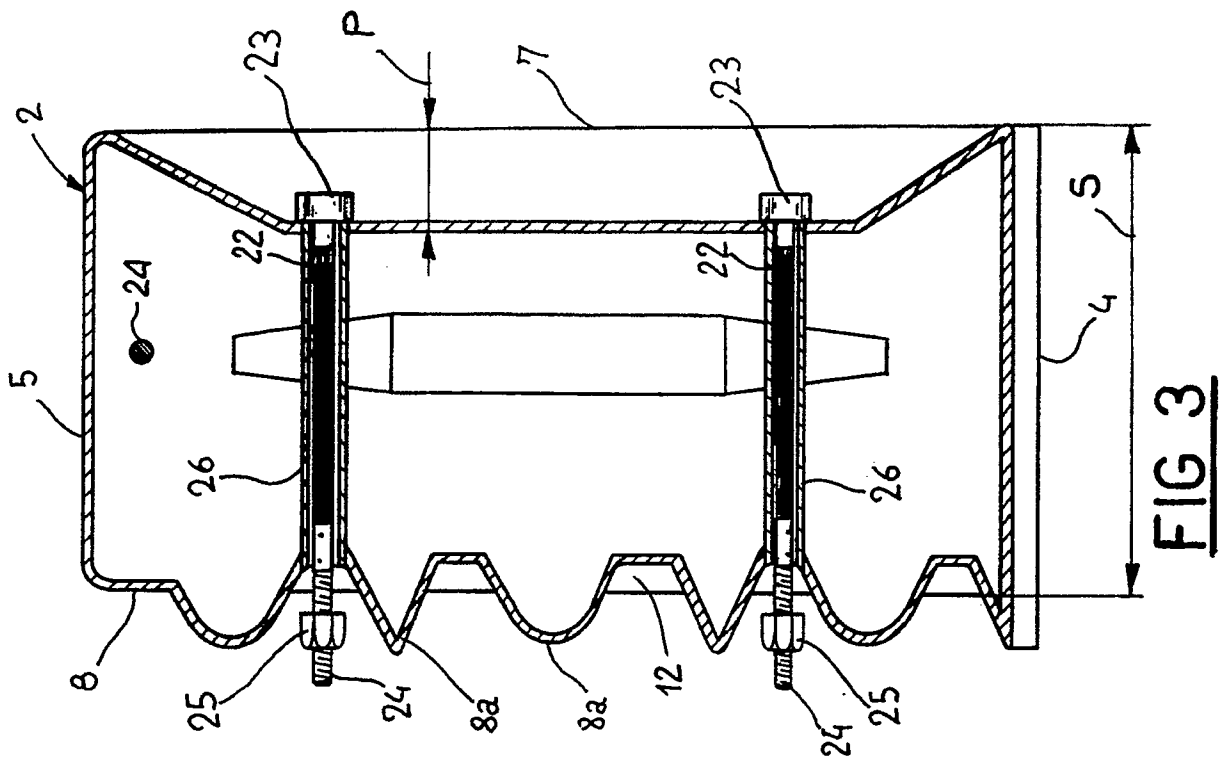


FIG. 2





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EUROPEAN SEARCH REPORT

Application Number

EP 90 83 0612

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)
Y	EP-A-0 297 182 (M.L. THOMPSON) * column 2, line 17 - line 21 * column 9, line 25 - line 29 @ column 15, line 8 - line 56; figures * - - - -	1,2,4,6	E 01 F 15/00
Y	EP-A-0 305 624 (BOSTRA TRADERS) * the whole document * - - - -	1,2,4,6	
A	DE-U-8 804 770 (SULO) * page 7, paragraph 2; figures * - - - -	1,2	
A	AU-B-5 546 14 (P.D. OCHOA) * the whole document * - - - -	1,3	
A	FR-A-2 598 484 (R.J. CHADOURNE) * abstract; figures 8-11 * - - - -	1,5	
A	DE-A-2 601 296 (H. HAMMRICH) * the whole document * - - - - -	1	
The present search report has been drawn up for all claims			
Place of search		Date of completion of search	Examiner
The Hague		19 April 91	VERVEER D.
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			