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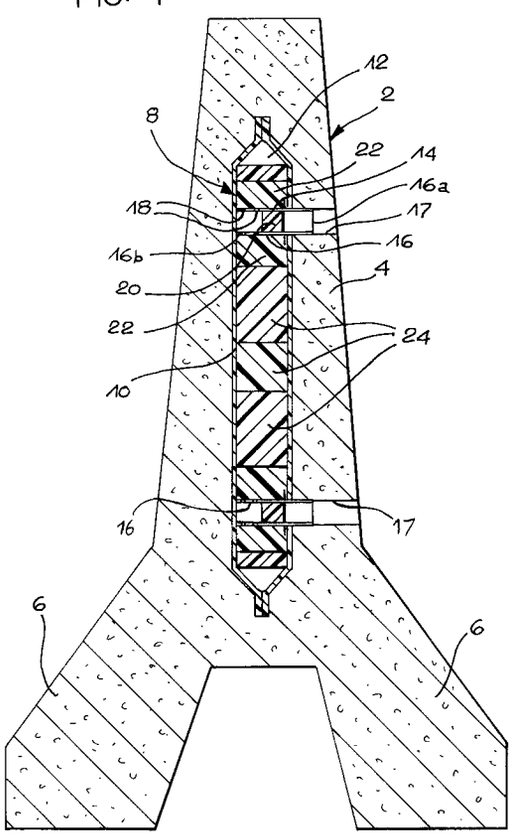
(54) Guard-rail with sound absorbing properties.

(57) The road-safety barrier includes a body (2) of concrete, cement or similar material associated with at least one container (8) having at least one cavity (12) which communicates with the exterior through at least one duct (17), and is at least partially filled with material (20, 22) having sound-absorbent properties. The container can also act as a Helmholtz resonator.

FIG. 1



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The present invention relates to road-safety barriers including a body of concrete, cement or similar material, which can be placed at the edges of the roadway or in the central region separating lanes of traffic travelling in opposite directions, to prevent motor vehicles from leaving the carriageway in the event of a skid.

The object of the present invention is to provide a barrier of the type indicated above which, as well as having the usual properties of mechanical strength and impact absorption, can also reduce noise due to the passage of motor vehicles.

This object is achieved by a road-safety barrier including a body of concrete, cement or similar material, characterised in that the body is associated with at least one container having at least one cavity which communicates with the exterior through at least one duct and is at least partially filled with material having sound-absorbent properties.

The container thus acts as a Helmholtz resonator, absorbing sound vibrations within a certain range of wavelengths which can be calculated, by formulae known to an expert in the art, from, amongst other things, the dimensions of the cavity and of the duct for communication with the exterior and from the properties of the sound-absorbent material.

Advantages and characteristics of the present invention will become clear from the detailed description which follows with reference to the appended drawings, provided by way of non-limiting example, in which:

Figure 1 is a sectional view of a road-safety barrier according to the invention, and

Figures 2 and 3 show alternative embodiments of road-safety barriers according to the invention.

With reference to Figure 1, a road-safety barrier has a body 2 of concrete, cement or similar material having an upper portion 4 with two supports 6 extending from its lower end. A substantially parallelepipedal container 8 having sound-absorbent properties is set within the body 2. The container 8 has an outer wall 10 defining a cavity 12 which communicates with the exterior through a pair of holes 14. A sleeve 16 located in each hole 14 has a first portion 16a, which projects into a respective duct 17 in the body 2 for communication with the exterior, and a second portion 16b which projects into the cavity 12 of the container 8. The second portion 16b has a plurality of holes 18 in its surface, contains a cylindrical element 20 of sound-absorbent material, and is surrounded by a tubular element 22, also of sound-absorbent material. The sound-absorbent material used may, for example, be glass wool.

The cavity 12 thus communicates with the exterior and can act as a Helmholtz resonator and cancel out sound vibrations within a predetermined range of wavelengths.

The container 8 also contains stiffening material 24 to provide it with adequate mechanical strength since it may be subject to considerable stresses during the production of the road safety barrier. For this purpose, in fact, a casting of concrete or the like is made in a form in which the container 8 has already been positioned. Since the safety barrier is of a considerable height, the container 8 is subjected to considerable hydraulic pressure by the fluid mass of setting concrete.

Figure 2 shows a further embodiment of the invention, in which the same reference numerals correspond to parts the same as or equivalent to those described above. In this embodiment, an outer surface of the concrete body 2 has three recesses 26 in which respective sound-absorbent containers 8 are inserted. The cavity 12 of each container 8 communicates with the exterior through a respective sleeve 16 and duct 17 similar to those described with reference to the previous embodiment. The recesses 26 are closed by a wall element 28 which holds the containers 8 within the body 2. The wall element 28 also has a transparent portion 30 in correspondence with a cavity 32 in the body 2.

The dimensions and positions of the containers 8 are such that each absorbs a specific range of sound vibrations. In particular, the lower container is intended to absorb low frequencies, the central container intermediate frequencies and the upper container high frequencies.

Figure 3 shows a further embodiment of the invention, in which the same reference numerals correspond to parts the same as or equivalent to those described above. In this embodiment, the container 8 is applied to the outside of the body 2 by fixing elements 30, and its cavity 12, which is also filled with sound-absorbent material 22 and reinforcing material 24, communicates with the exterior by means of a pair of ducts 17 which extend through the body 2. A cavity 34 in the body 2 enables a bolt or the like to be inserted to fix the safety barrier to the ground.

Claims

1. A road-safety barrier including a body (2) of concrete, cement or similar material, characterised in that the body (2) is associated with at least one container (8) having at least one cavity (12) which communicates with the exterior through at least one duct (17) and is at least partially filled with material (20, 22) having sound-absorbent properties.

2. A road-safety barrier according to Claim 1, characterised in that the container (8) has at least one hole (14) containing a sleeve (16) having a first portion (16a) which projects into the duct (17) for communication with the exterior and a second portion (16b), which projects into the cavity (12) in the container (8), has a plurality of holes (18) in its surface, contains a cylindrical element (20) of sound-absorbent material, and is surrounded by a tubular element (22) of sound-absorbent material.

3. A road-safety barrier according to Claim 1 or Claim 2, characterised in that the container (8) is set within the body (2) of the barrier.

4. A road-safety barrier according to Claim 1 or Claim 2, characterised in that it includes three containers (8) located in respective recesses (26) in an outer surface of the body (2), the recesses (26) being closed by a wall element (28) which holds the containers (8) within the body (2).

5. A road-safety barrier according to Claim 1, characterised in that the container (8) is applied to an outer surface of the body (2) of the barrier by means of fixing elements (30) and the cavity (12) communicates with at least one duct (17) which is formed in the body and opens to the exterior.

6. A road-safety barrier according to any one of the preceding claims, characterised in that the container (8) contains a material (24) suitable for providing the container with characteristics of structural strength.

FIG. 1

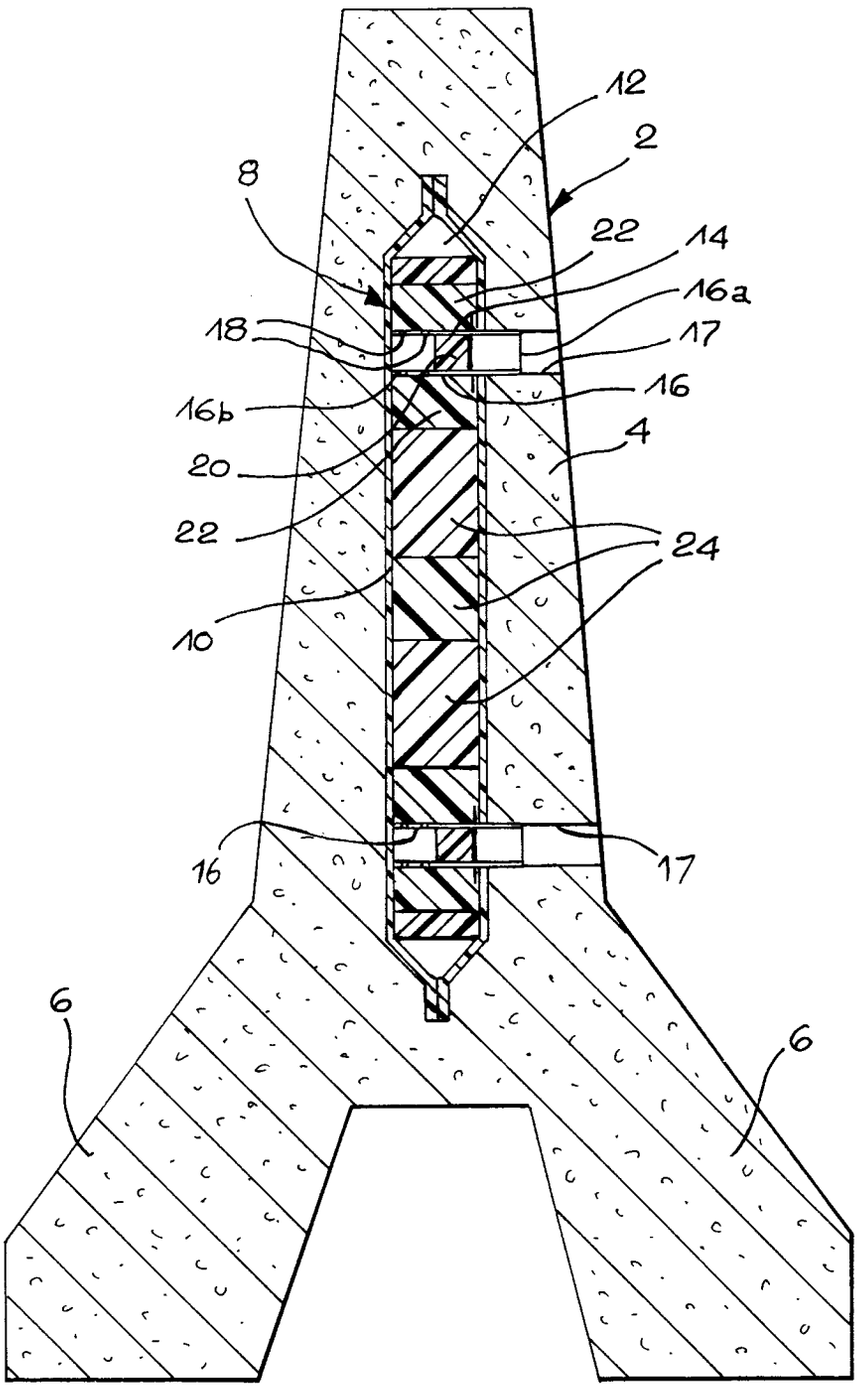

FIG. 2

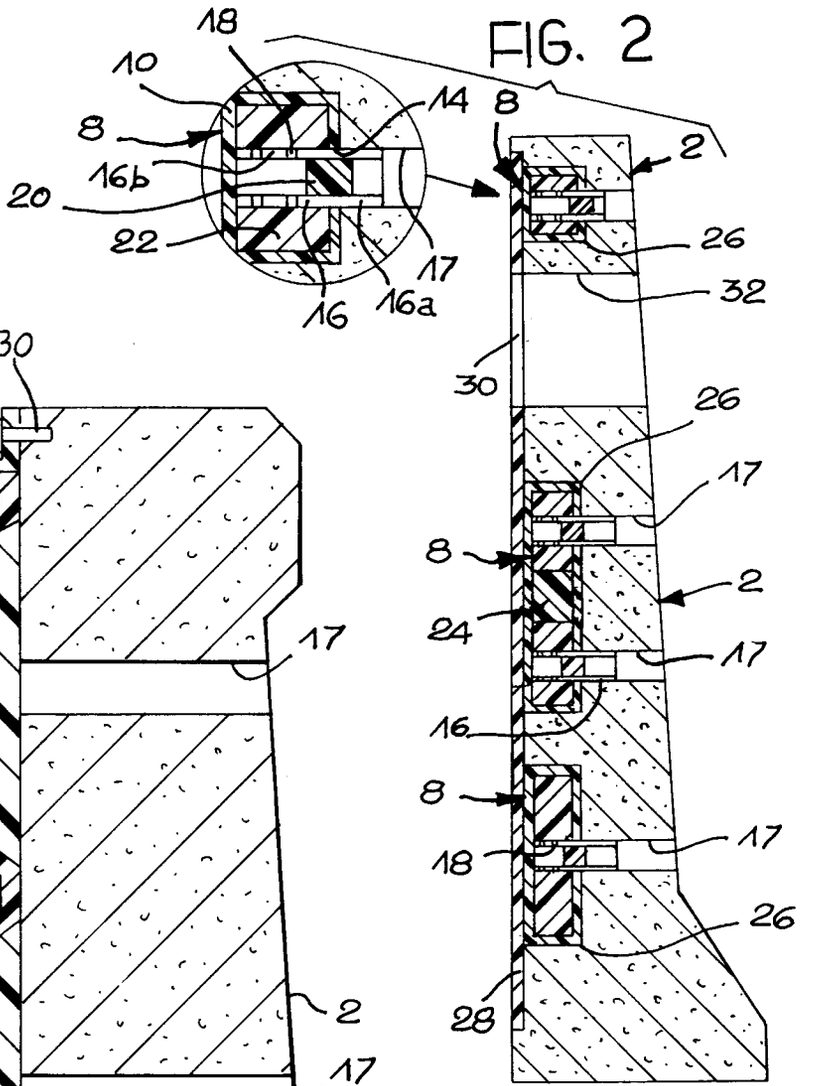
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FIG. 3

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European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 10 9795

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	EP-A-0 014 172 (ARBED SA) * abstract; figure 4 * -----	1	E01F15/00 E01F9/08

TECHNICAL FIELDS SEARCHED (Int. Cl.5)
E01F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	25 SEPTEMBER 1992	VERVEER D.

CATEGORY OF CITED DOCUMENTS

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