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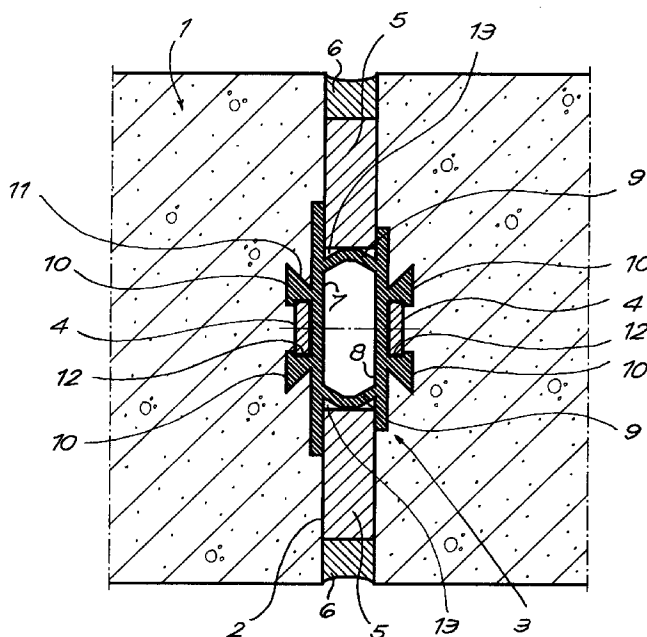
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(54) Expansion joint in concrete constructions

(57) Expansion joint in concrete structures, which comprises two portions to be anchored in the concrete at either side of the expansion joint (2), and a central compressible expansion portion located between them, destined to be located in the expansion joint (2), characterised in that the portions to be applied in the concrete are formed by two side walls (7, 8) extending along each

other, which are provided, on their sides directed towards each other, with two elastic ribs (10) between which therefore a space is formed for a material which swells under the influence of moisture, while the extension portion is formed by at least one elastically deformable bridge (9) between the two side walls (7, 8).



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Description

[0001] The present invention relates to an expansion profile, more specifically for expansion joints in concrete constructions, which expansion profile is of the type comprising two portions to be anchored in the concrete at either side of the expansion joint, and a central compressible expansion portion destined to be located in the expansion joint.

[0002] Expansion joints in concrete constructions are essential to meet the consequences of thermal expansion of the concrete. If the concrete is reinforced, the reinforcement ends at the place of the expansion joint.

[0003] Such expansion joints are traditionally filled with an elastic expansion profile of the above-mentioned kind, at the front and back side thereof an expansion filler plate, for instance of wood fibres, synthetic foam or cork, and at the outer edges of the joint an elastic sealing mass or mastic.

[0004] The expansion profile, mostly of PVC or rubber, in the middle of the joint prevents that water which would possibly leak through the elastic sealing mass would flow straight through the joint.

[0005] The known expansion profiles comprise a central portion while the two portions at either side thereof are flat wings which show a round thickening at their outer edges.

[0006] In order to obtain a waterproof sealing of the expansion joint, it is imperative that no water can leak past the wings applied in the concrete.

[0007] With these known expansion profiles, the waterproof capacities are based on a strong compression of the concrete around the thickenings of the wings and the pressure exerted by the thermal deformation of the concrete.

[0008] In order to improve the waterproof capacities, it is known to apply a swelling material in the shape of rubber strips on the thickened edges of the wings. These swelling strips will swell in case of a possible moisture seepage, and therefore press against the concrete in order to compensate for an imperfect compression of the concrete.

[0009] However, the quality of the compression of the concrete around these thickenings is not always enough to ensure the waterproof capacities, even with such strips from swelling rubber, due to the possible porosity of the concrete.

[0010] Moreover, the application of such an expansion profile is not simple, due to its form and dimensions.

[0011] The invention relates to an expansion profile which does not show the above-mentioned and other disadvantages, is relatively easy to apply and allows for a good liquid sealing.

[0012] This aim is realised according to the invention by the fact that portions destined to be applied in the concrete, are formed by two side walls extending alongside each other which are provided, on their sides directed away from each other, with two elastic ribs

between which therefore a space is formed for a material which swells under the influence of liquid, while the expansion portion is formed by at least one elastically deformable bridge between the two side walls.

[0013] The expansion profile preferably comprises two elastically deformable bridges which thus form, together with the two side walls, a case.

[0014] Both side walls can extend, at both longitudinal edges of the expansion profile, beyond the bridge or bridges, so that at both edges gutters are formed for applying joint filler plates.

[0015] The two ribs on a side wall preferably have outsides which extend away from each other from the side wall.

[0016] The insides of the two ribs on a side wall can be provided with grooves directed towards each other for catching the edges of a strip of swelling material.

[0017] The above-mentioned expansion profile can be commercialised as such.

[0018] However, the invention also relates to such an expansion profile whereby between the ribs on either side a material is applied which swells under the influence of moisture.

[0019] This material can have the form of a strip.

[0020] Suitable swelling materials are bentonite, water swelling resin or water swelling rubber compounds or a combination of two or more of these materials.

[0021] In order to better show the characteristics of the invention, an expansion profile according to the invention is described hereafter, as an example without any limitative character whatsoever, reference being made to the accompanying drawing representing an expansion joint in concrete in which an expansion profile according to the invention has been applied.

[0022] The figure represents a part of a concrete wall 1 in which an expansion joint 2 has been applied.

[0023] This concrete wall 1 can be part of a building, a reservoir, a canal, a dike, a foundation etc.

[0024] Halfway between the front side and the back side of this concrete wall 1, in the expansion joint 2 an expansion profile 3 according to the invention is present, which is for instance made of PVC and provided with two strips 4 of material which swells under the influence of moisture, and the front side and back side thereof a joint filling plate 5, for instance of wood fibres, synthetic foam or cork, and on the front and back extremities a strip 6 or elastic sealant such as mastic.

[0025] The expansion profile 3 mainly consists of two side walls 7 and 8, extending alongside and almost parallel to each other, which are connected to each other by two elastically deformable bridges 9 and which are provided, on their sides which are directed away from each other, with two ribs 10 which extend parallel to each other over the entire length of the expansion profile 3.

[0026] The outsides 11, directed away from each other, of the two neighbouring ribs 10, are slantingly directed to the outside of the side wall 7 or 8 and diverge

towards the outside.

[0027] The insides, directed towards each other, of these two ribs 10 are provided against the side wall 7 or 8 with a groove 12 for one of the above-mentioned strips 4 of a material which swells under the influence of moisture, such as bentonite, resin which swells under the influence of liquid or rubber which swells under the influence of liquid.

[0028] The elastically deformable bridges 9 are formed by two walls which are bent or form an obtuse angle.

[0029] At both longitudinal edges of the expansion profile 3 the side walls 7 and 8 extend beyond the bridges 9, the side wall 7 slightly more than the side wall 8. Thus, in the longitudinal edges gutters 13 are formed in which the edges of the joint filler plates 5 fit.

[0030] After the application in an expansion joint 2 in a concrete wall 1, the side walls 7 and 8, together with the ribs 10 standing thereon, form parts which are cast in the concrete while the bridges 9 form parts which are located in the expansion joint 2 and limit, together with the side walls 7 and 8, a case of which the width of the opening corresponds with the thickness of the expansion joint 2.

[0031] The application of the expansion profile 3 is done as follows.

[0032] The edges of the side wall 7 are attached to the inside of the shuttering for the part of the concrete wall 1 at one side of the expansion joint 2, in such a way that the ribs 10 between which a strip 4 of swelling material has been applied, are directed towards the inside of the shuttering.

[0033] Subsequently, concrete is poured in this shuttering.

[0034] After the concrete has hardened enough and this shuttering has been removed, the joint filler plates 5 are applied in the gutters 13, the shuttering is placed for the next part of the concrete wall 1 and also this shuttering is poured full.

[0035] The edges of the side wall 7 are located at the surface of the concrete of the first part and the joint filler plates 5 link up with these edges and the concrete. When pouring the concrete in the second shuttering, the edges of the side wall 8 are pressed against the joint filler plates 5 and also these edges are located in the surface of the concrete of the second part of the concrete wall 1.

[0036] In both concrete parts concrete is located between the slanting outside 11 of the ribs 10 and the side wall 7 or 8, while strips 4, which are located against these side walls 7 and 8, are applied with their edges in the grooves 12 or neighbouring ribs 10.

[0037] Moisture which would possibly penetrate in the expansion joint 2 and seep between the edges of the side walls 7 and 8 and the joint filler plates 5, is stopped by a bridge 9.

[0038] Moisture which would seep at the concrete side of the side wall 7 or 8, has to flow around a rib 10 and

then comes into contact with a strip 4 which will swell under the influence of his moisture.

[0039] As a result, this strip 4 pushes the two ribs 10 between which it has been applied away from each other, so that they are firmly pushed against the concrete and especially the slanting outsides 11 are pressed against the concrete so that the possible leak over one of these outsides 11 is closed off.

[0040] The shape of the expansion profile 3 allows an easy application and allows that the concrete is pressed against it reasonably well.

[0041] Should a leak occur anyway, the ribs 10 form as it were valves which are operated by the swelling material and which immediately stop a possible seeping of moisture.

[0042] The expansion profile 3 is active in both directions and seals both for drinking water as for ground water, salt water, sewage water, and even liquids other than water.

[0043] The invention is in no way limited to the embodiment described above and represented in the drawing, but such an expansion joint can be realised in different variants without leaving the scope of the invention.

Claims

1. Expansion joint in concrete structures, which comprises two portions to be anchored in the concrete at either side of the expansion joint (2), and a central compressible expansion portion located between them, destined to be located in the expansion joint (2), characterised in that the portions to be applied in the concrete are formed by two side walls (7, 8) extending along each other, which are provided, on their sides directed towards each other, with two elastic ribs (10) between which therefore a space is formed for a material which swells under the influence of moisture, while the extension portion is formed by at least one elastically deformable bridge (9) between the two side walls (7, 8).
2. Expansion joint according to claim 1, characterised in that it comprises two elastically deformable bridges (9) which therefore form, together with the side walls (7, 8) a case.
3. Expansion joint according to claim 1 or 2, characterised in that both side walls (7, 8) extend at both longitudinal edges of the expansion profile (3) beyond the bridge (9) so that at both edges gutters (13) are formed for applying joint filler plates (5).
4. Expansion joint according to any one of the preceding claims, characterised in that the two ribs on a side wall (7, 8) have outsides (11) which diverge with respect to one another from the side wall (7, 8).

5. Expansion joint according to any one of the preceding claims, characterised in that the insides of the two ribs (10) on a side wall (7, 8) are provided with grooves (12) directed away from each other, for catching the edges of a strip (4) of a material which swells under the influence of moisture. 5
6. Expansion joint according to any one of the preceding claims, characterised in that between the ribs (10) on either side a material is applied which swells under the influence of moisture. 10
7. Expansion joint according to claims 5 and 6, characterised in that the swelling material has the form of a strip (4). 15
8. Expansion joint according to any one of claims 5 to 7, characterised in that the swelling material comprises one or more substances from the following group: bentonite, resin which swells under the influence of liquid and rubber which swells under the influence of liquid. 20

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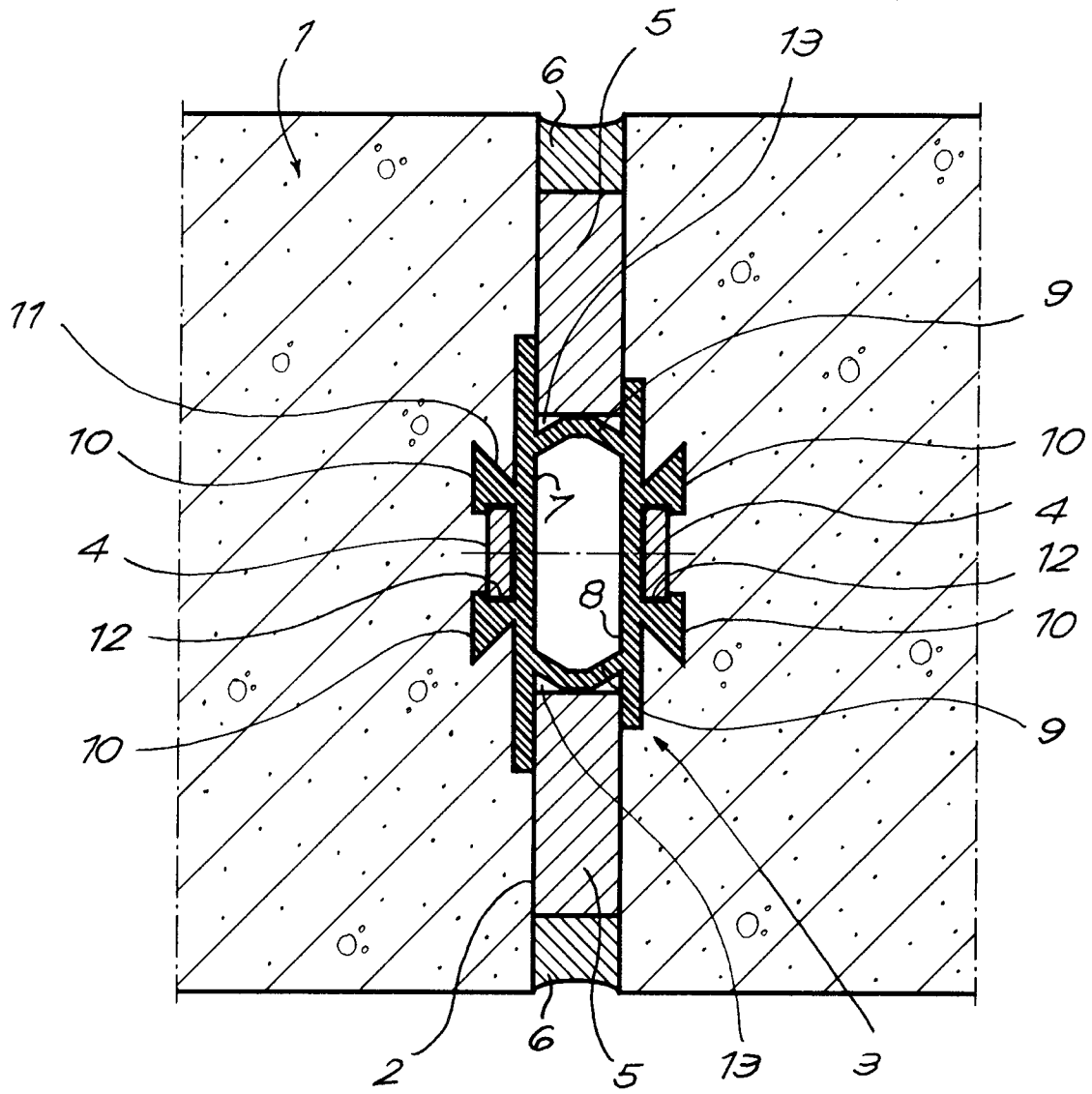
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EUROPEAN SEARCH REPORT

Application Number
EP 98 20 2548

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	GB 727 936 A (HARZA) * page 2, line 11 - page 3, line 46; figures * ---	1,2,4, 6-8	E04B1/68
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29 April 1999	Examiner Porwoll, H
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	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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