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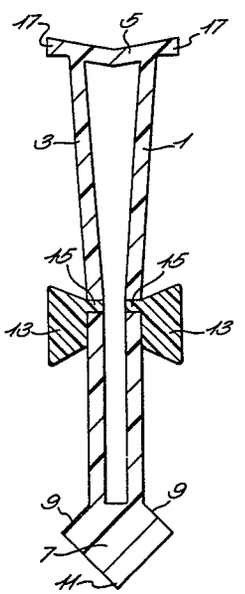
(54) Improved crack inducing and sealing strip.

(57) A crack inducing and sealing strip for insertion into wet slabs of concrete to provide a crack inducer and a seal for the induced crack in the set concrete, the strip being extruded from resiliently deformable elastomeric materials and comprising a hollow member having a pair of spaced side walls (1 and 3), a top wall (5) and a base (7) which is preferably enlarged, there being a keying ridge (13) projecting laterally from each side wall approximately midway between the top and bottom of the walls and the strip preferably also including laterally projecting flanges (17) at its upper end. The keying ridges may be formed of softer material in which case lines of weakness may also be provided in the side walls formed by the softer material from which the keying ridges are formed.



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Improved crack inducing and sealing strip

This invention relates to improved crack inducing and sealing strips for inducing a controlled crack in concrete and thus providing a contraction joint and sealing strip for the joint.

When large areas of concrete are poured, it is necessary to divide the area into smaller areas by means of crack inducers or joint formers. These are in the form of extruded resiliently deformable strips of material which are normally introduced into the wet concrete and penetrate about one-third to one-quarter of the overall depth of the concrete slab. This strip causes a plane of weakness in the concrete as it dries and subsequently shrinks, thus inducing a controlled crack which provides a contraction joint. At the same time the strip acts as a seal.

It is important that the crack inducing and sealing strip, once inserted in the wet concrete, does not come out again due to its natural buoyancy and also it is important, after the concrete has set, that the strip cannot fall out or be removed. To ensure this, therefore, a suitable keying device is normally provided on part of the strip. What is more, once the concrete has dried it is important that water does not penetrate through the contraction joint either from above or below the concrete and likewise it is preferable that dust and other dirt does not find its way into the contraction joint when it has opened up. The crack inducer and sealing strips of the present invention are designed to meet all these requirements.

According to the present invention, we provide a crack inducing and sealing strip for insertion into wet concrete to provide a line of weakness and hence a contraction joint, the strip being extruded from resiliently deformable elastomeric material and being several times deeper than it is wide, there being a keying ridge on each side face of the strip which is preferably formed of a

softer material than the remainder of the strip, the strip being hollow and having two spaced apart side walls joined together just along the top and along the bottom of the strip.

Preferably, at its upper end the strip is provided with a laterally extending flange on each of its side faces.

Preferably, the strip is provided with a generally diamond shaped enlargement at its lower end.

The upper portion of the strip may be detachable from the lower portion and in a preferred arrangement, therefore, the upper portion is joined to the lower portion by a layer of softer material, said layer extending completely through the said side walls of the strip and being integral with its adjacent keying ridge.

In one construction, the portion joining together the side walls of the strip at their tops may be formed of softer material than the remainder of the strip.

Two crack inducing and sealing strips according to the present invention are now described by way of example with reference to Figures 1 and 2 of the accompanying drawings, both of which are sectional views.

Referring to Figure 1 of the drawings, the strip is extruded from resiliently deformable materials, e.g. an elastomer such as a synthetic thermoplastic resinous material, in the form of a generally hollow body having a pair of spaced side walls 1 and 3 joined together at their upper end by a top wall 5, joined together at their lower end by a solid diamond shaped enlargement 7. The corners 9 of the enlargement 7 project outwardly below the walls 1 and 3 for keying purposes, whereas the corner 11 is designed to be forced down into a mass of wet concrete.

The strip is formed by means of a dual durometer extrusion process and substantially midway between the top and bottom of each side wall 1 and 3, a keying ridge 13 is provided, these keying ridges being wider at their extremity than at their root and being of generally trapezium shaped construction. The keying ridges are formed

of a softer material than the side walls of the strip and it is preferred that this soft material extends completely through the side walls as shown at 15 so as to provide a line of weakness in each of the side walls 1 and 3 to enable the top portion of the strip to be removed from the remainder of the strip, as will hereinafter be described.

At the top of the strip, laterally projecting flanges formed as extensions of the top wall 5 are provided so as to increase the width of the strip. As can be seen from the drawing, the strip is about 8 times as tall as its mean width.

The keying ridges 13, because of their shape, will form a strong key with the concrete once the strip has been inserted into the concrete, making it difficult for the strip to float out of the concrete while it is still wet. Furthermore, they will form a key with the concrete in both vertical and lateral directions and when the concrete contracts, as is customary, with the result that a contraction joint will be formed throughout the depth of the concrete beneath the strip, the ridges 13 will still remain keyed with the concrete because of their shape. Also, because they are of a soft resiliently deformable material, they will form a good seal with the concrete and if anything this seal will increase in effectiveness as the concrete contracts, due to the wedging action of the ridges 13. Of course, because the strip is hollow, the ridges 13 will be able to move with the contracting concrete to some extent, but the natural resiliency of the material of the side walls 1 and 3 will resist such movement on the whole.

The presence of the flanges 17 at the top of the strip, the upper surface of which is arranged to be flush with the upper surface of the concrete, will ensure that, even when the concrete contracts, the joint which opens up will still be overlayed by the top of the strip, thus making it difficult for dust and other particles to penetrate the joint. It is advantageous that this does not occur, otherwise, when the concrete slab increases in

temperature and expands, any particles within the joint will tend to restrict expansion of the concrete, thus causing load transference to take place, with resultant damage to the sealing strip or the slab of concrete itself.

Any moisture which may penetrate the joint either from above or below will tend to be maintained either above or below the concrete slab by the presence of the keying ridges 13 which also act as good moisture seals.

In some instances, after the concrete has dried, it is desirable to remove an upper portion of the crack inducing and sealing strip so that the contraction joint can be sealed with bitumen or another sealing compound. Because of the provision of the lines of weakness provided by the soft material 15 in the strip, all of the strip above the keying ridges 13 can be torn away from the lower portion of the strip for this purpose. This will then leave a groove in the concrete into which the bitumen or other sealing compound can be poured in known manner. The remaining part of the strip however will still provide a good seal across the contraction joint in the concrete.

An alternative construction of strip is shown in Figure 2, and parts similar to those of Figure 1 have the same reference numerals. The strip differs from that in Figure 1, however, in that keying ridges 13a are provided which are formed of the same materials as the side walls 1 and 3. They could however be formed of a softer material.

Furthermore, the side walls 1 and 3 are joined together at their top edges by a strip of soft elastomeric material 5a which is shown as being, but is not necessarily, softer than the side walls 1, 3. This strip of material 5a could be of a foamed construction, or have passages running along its length. It will also be appreciated that the flanges 17 may be omitted.

As shown in Figure 2, the englargement 7 is of a different construction from that shown in Figure 1. It should also be noted that the shape of the side walls may be altered. They could, for example, diverge more

towards the top of the strip. It is important however, that the side walls 1, 3 and the top 5 or 5a of the strip can flex to permit the two strips of concrete on either side of the strip to move relative to each other.

Because the strips are formed of resiliently deformable elastomeric material, the keying wedges 13, 13a, after the concrete has contracted, form an extremely effective moisture seal or barrier between the top and bottom of the joint, due to the tension set up as a result of the side walls of the strip being moved apart slightly during contraction.

CLAIMS:

1. A crack inducing and sealing strip for insertion into wet concrete to provide a line of weakness and hence a contraction joint, the strip being extruded from resiliently deformable elastomeric material and being several times deeper than it is wide, the strip being hollow and having two spaced apart side walls joined together just along the top and along the bottom of the strip, and there being a keying ridge on the outer face of each of said side walls of the strip, which key and form a seal with the concrete once it has hardened.

2. A crack inducing and sealing strip according to claim 1 wherein, at its upper end, the strip is provided with a laterally extending flange on each of its side faces.

3. A crack inducing and sealing strip according to claim 1 or 2 wherein a generally diamond shaped enlargement is provided on the lower end of the strip.

4. A crack inducing and sealing strip according to any of claims 1-3 wherein the upper portion of the strip is detachable from the lower portion.

5. A crack inducing and sealing strip according to claim 4 wherein the upper portion is joined to the lower portion by a layer of softer material, the layer extending completely through the side walls of the strip and being located in the region of its respective keying ridge.

6. A crack inducing and sealing strip according to any of claims 1-5 wherein the keying ridges are formed of a softer material than the remainder of the strip.

7. A crack inducing and sealing strip according to claim 6 when dependent on claim 5 wherein the keying ridges and layer of softer material on each side wall are integral with each other.

8. A crack inducing and sealing strip according to any one of the preceding claims wherein the portion joining together the side walls of the strip at their tops is formed of a softer material than the remainder of the strip.

9. A crack inducing and sealing strip substantially as hereinbefore described with reference to Figure 1 of the

accompanying drawings.

10. A crack inducing and sealing strip substantially as hereinbefore described with reference to Figure 2 of the accompanying drawings.

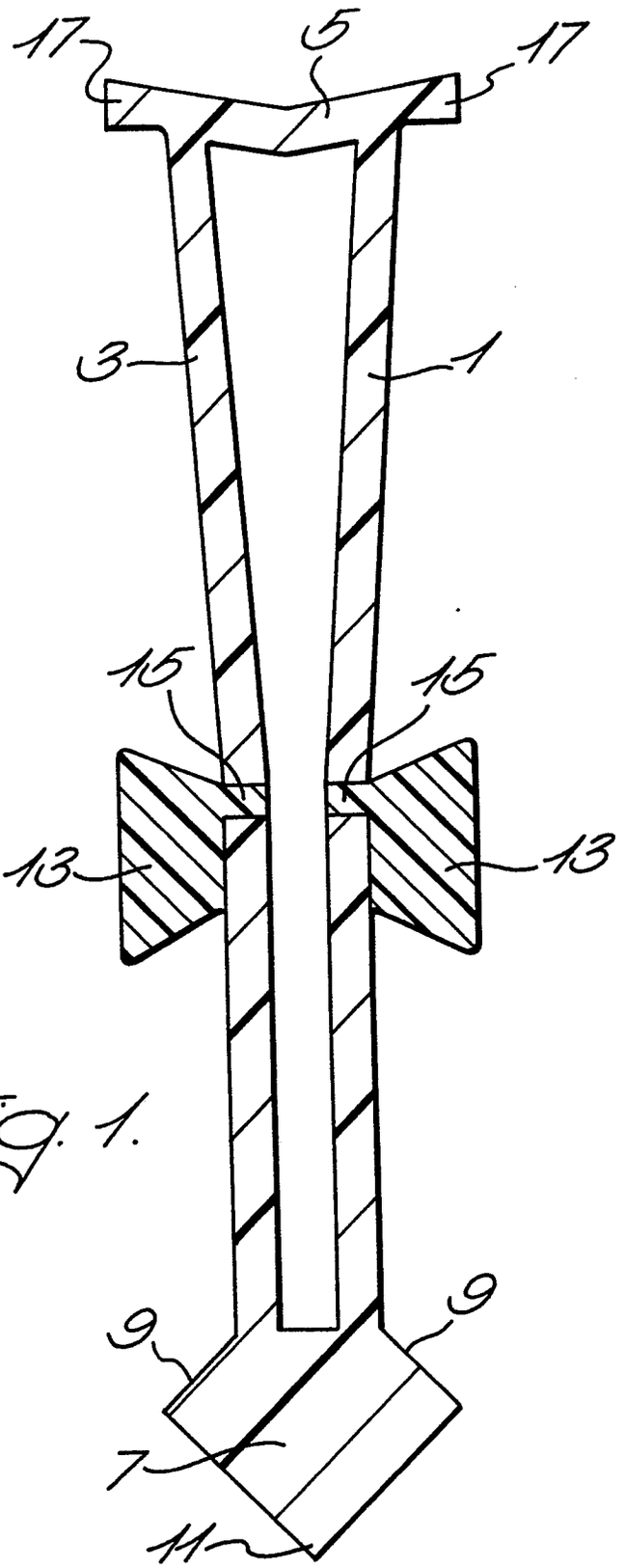

Fig. 1.

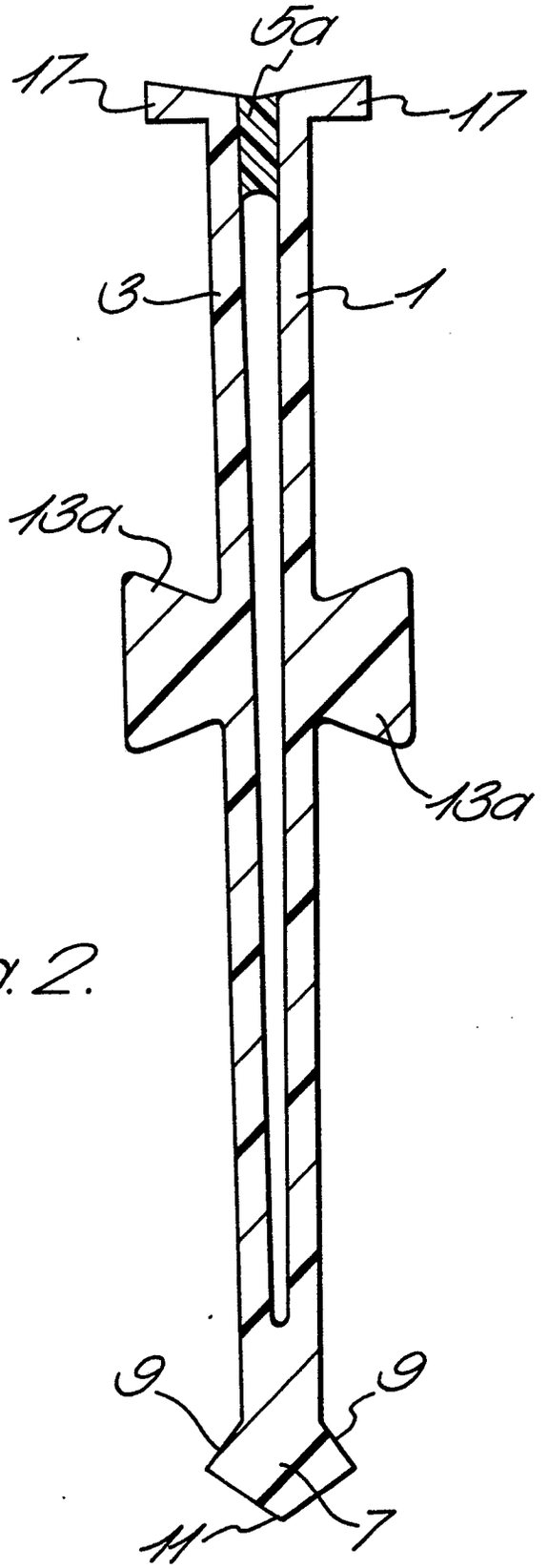

Fig. 2.

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EUROPEAN SEARCH REPORT

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Application number

EP 79 30 2165

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
	US - A - 3 575 094 (C.S. HEWITT) * Figure 4; claims 1-2 *	1,2
	US - A - 3 434 401 (J.L. KIEWIT) * Figures 1,4; column 2, lines 14-30; claims 1-5 *	1,2,3
A	US - A - 3 871 787 (W.J. STEGMEIER) * Figures 2,4,5,6; column 1, lines 3-8; column 3, lines 38-64; column 5, lines 34-49; column 6, lines 5-68; column 7, lines 1-21; claims *	1,2

CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)

E 04 B 1/68
C 09 K 3/10

TECHNICAL FIELDS SEARCHED (Int.Cl. 3)

E 04 B 1/68
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CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	29-11-1979	BOULON

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