

PATENT SPECIFICATION 1,008,811

DRAWINGS ATTACHED.

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COMPLETE SPECIFICATION.

Moisture or Water Barrier at Joints in Concrete Structures.

We, TRETOL-SERVICISED LIMITED, a British Company, of Tretol House, The Hyde, London, N.W.9, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to means for preventing the passage of moisture or water through the joints in concrete structures, such as floors, bases and walls below and, in certain cases, above ground level.

It is common practice to seal off such joints by means of so-called waterstops, which consist of extruded or moulded sections of rubber or other flexible plastics materials, such as polyvinyl chloride. A conventional waterstop section usually has enlarged formations, at both edges, or projections on both faces, by means of which it is anchored in the concrete so as to span the gap between adjacent blocks and thereby also become secured. A conventional waterstop is cast into the concrete so as to be wholly encased therein. The enlarged formation or projections are in the form of ribs or flanges of uniform thickness, or of a thickness which diminishes towards the free edge of the rib or flange, serving merely to anchor the strap-like water-stop against a transverse pull. In structures in which there are effectively two layers of symmetrically positioned steel reinforcement, the layer of reinforcement on the moist side of the water-stop is not protected thereby and is in consequence subject to rusting.

The present invention provides a new form of moisture and water barrier, which operates in a different manner from conventional waterstops. This barrier utilises an

extruded or moulded section of rubber or other moisture and water resistant flexible plastics material, the extruded or moulded section comprising a strip-like body, having formations for keying into concrete projecting laterally from only one face thereof, the keying formations broadening out from their root. Such moulded or extruded section is referred to as 'a waterstop as hereinbefore described'. Many different profiles are possible for the keying formations, but one such formation may represent a flange or rib having, in section, the form of an inverted triangle. Alternatively the flange or rib may have a T-section. There are preferably two pairs of keying formations, arranged on opposite sides of the centre line of the strip-like body. The keying formations are preferably arranged a little inwardly from the edges of the strip-like body, in accordance with our divisional application no. 21267/65 (Serial 1,008,812).

The opposite face of the strip-like body is preferably flat or at least devoid of substantially projecting formations. The strip-like body may however have a hollow bulb on the centre line of the section to take up movement at expansion joints. To keep the outer surface of the strip-like body devoid of projections, the bulb may be generally hemi-cylindrical.

The invention consists broadly, in a method of providing a water seal in cast concrete which comprises positioning a waterstop as hereinbefore described, flat on a base onto which concrete is to be cast, or securing the waterstop to the shuttering in the case of a generally vertical structure, and casting concrete sections so that a joint between the sections is positioned between keying formations of the waterstop, said keying

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SPECIFICATION AMENDED - SEE ATTACHED SLIP
SEE ERRATA SLIP ATTACHED

formations becoming embedded in the concrete.

This method of use confers considerable advantages. In the case of a floor or base different lengths of the waterstop may be cut and joined together and laid before pouring is commenced, so that a complete moisture and water barrier is prefabricated for all the joints in the floor or base. Another advantage is that the rather complicated stop-end shuttering, required with conventional water-stop sections, is eliminated.

In wall joints the novel moisture or water barrier is again very simple to employ. For these joints the waterstop as hereinbefore described is simply nailed to the shuttering at the requisite position. The reason that the keying formations are preferably positioned a little inwardly from the edge of the strip-like body, in accordance with our divisional application no. 21267/65 (Serial 1,008,812), is to provide a marginal portion into which such nails may be driven without affecting the function of the moisture or water barrier.

The invention will be described further with reference to the accompanying drawings of which:

Figure 1 is a perspective view of a short length of water stop as hereinbefore described whilst

Figure 2 is a sectional view on the line A—A of Figure 1.

The waterstop comprises a body portion 1 in the form of a strip having on one face only, keying formations 3 and 4, there being two keying formations spaced transversely apart and disposed on each side of the centre line of the strip-like body portion 1. In the arrangement illustrated, these two keying formations are made up of the T-section rib 3 and the dovetail section rib 4, these being illustrated on the same strip for the purpose of exemplification. It will of course be understood that in a practical embodiment all the keying formations may if desired have a similar cross-section. The outermost keying formations (4) are spaced inwardly from the margins of the body portion 1 to leave edge portions 5 whereby the water stop may be tacked in position onto shuttering without damaging those portions lying inwardly of the ribs 4.

In use, where the bottom gap between two cast concrete sections is to be sealed, the water stop is laid on the floor and the shuttering is positioned so that half of the width of the water stop protrudes into the area where the concrete is to be cast. The ribs 3 and 4 to one side of the water stop thus become embedded in the concrete 6 and the enlarged head portions of these ribs serve to hold the water stop in position should there be any local subsidence of the supporting ground. When the shuttering has

been removed the next concrete section 7 can be cast so that the remaining of the water stop becomes embedded in this adjoining section. If a joint above ground level on a vertical surface is to be sealed, the water stop can be nailed through the edge portions 5 onto the vertical face of the shuttering and a concrete section cast up to a level (where the water stop runs horizontally) so as to embed two lower most ribs of the waterstop. Concrete cast over the top of this will embed the uppermost ribs of the waterstop. Where the waterstop runs vertically the additional shuttering will be positioned so that the cast concrete in the first instance extends horizontally to a position more or less at the midway line of the water stop. In either case, because of the special shape of the waterstop ribs 3 and 4, the shuttering can be pulled away without pulling the water stop away from the cast face of the concrete and of course, in all three cases, the water stop is not embedded in the concrete but is exposed across its rear face.

In a modification, the central portion of the water stop body portion 1 is arched to assume a generally hemi-cylindrical form the latter being of course open at the rear face. This permits the body portion 1 to be stretched somewhat in a transverse direction. The arching of the centre portion is of course in the same direction as that in which the keying formations project.

In our divisional application No. 21267/ 100 65 (Serial 1,008,812) there is claimed a water stop as hereinbefore described, in which the keying formations leave a marginal portion of the body through which nails may be driven whereby the water stop may be nailed 105 to shuttering. Our divisional application also claims a concrete joint generally as claimed herein subject to the water stop having the aforementioned marginal portion, which is outboard of the keying formations, and it 110 further claims a method of making such a concrete joint in which the water stop is nailed to shuttering at the requisite position through an edge portion along at least one 115 edge of the water stop this edge portion being outboard of any keying formation.

WHAT WE CLAIM IS:—

1. A method of providing a water seal in cast concrete which comprises positioning a waterstop as hereinbefore described, flat 120 on a base onto which concrete is to be cast, or securing the waterstop to the shuttering in the case of a generally vertical structure, and casting concrete sections so that a joint between the sections is positioned between 125 keying formations of the waterstop, said keying formations becoming embedded in the concrete.

formations becoming embedded in the concrete.

This method of use confers considerable advantages. In the case of a floor or base different lengths of the waterstop may be cut and joined together and laid before pouring is commenced, so that a complete moisture and water barrier is prefabricated for all the joints in the floor or base. Another advantage is that the rather complicated stop-end shuttering, required with conventional waterstop sections, is eliminated.

In wall joints the novel moisture or water barrier is again very simple to employ. For these joints the waterstop as hereinbefore described is simply nailed to the shuttering at the requisite position. The reason that the keying formations are preferably positioned a little inwardly from the edge of the strip-like body, in accordance with our divisional application no. 21267/65 (Serial 1,008,812), is to provide a marginal portion into which such nails may be driven without affecting the function of the moisture or water barrier.

The invention will be described further with reference to the accompanying drawings of which:

Figure 1 is a perspective view of a short length of water stop as hereinbefore described whilst

Figure 2 is a sectional view on the line A—A of Figure 1.

The waterstop comprises a body portion 1 in the form of a strip having on one face only, keying formations 3 and 4, there being two keying formations spaced transversely apart and disposed on each side of the centre line of the strip-like body portion 1. In the arrangement illustrated, these two keying formations are made up of the T-section rib 3 and the dovetail section rib 4, these being illustrated on the same strip for the purpose of exemplification. It will of course be understood that in a practical embodiment all the keying formations may if desired have a similar cross-section. The outermost keying formations (4) are spaced inwardly from the margins of the body portion 1 to leave edge portions 5 whereby the water stop may be tacked in position onto shuttering without damaging those portions lying inwardly of the ribs 4.

In use, where the bottom gap between two cast concrete sections is to be sealed, the water stop is laid on the floor and the shuttering is positioned so that half of the width of the water stop protrudes into the area where the concrete is to be cast. The ribs 3 and 4 to one side of the water stop thus become embedded in the concrete 6 and the enlarged head portions of these ribs serve to hold the water stop in position should there be any local subsidence of the supporting ground. When the shuttering has

been removed the next concrete section 7 can be cast so that the remaining of the water stop becomes embedded in this adjoining section. If a joint above ground level on a vertical surface is to be sealed, the water stop can be nailed through the edge portions 5 onto the vertical face of the shuttering and a concrete section cast up to a level (where the water stop runs horizontally) so as to embed two lower most ribs of the waterstop. Concrete cast over the top of this will embed the uppermost ribs of the waterstop. Where the waterstop runs vertically the additional shuttering will be positioned so that the cast concrete in the first instance extends horizontally to a position more or less at the midway line of the water stop. In either case, because of the special shape of the waterstop ribs 3 and 4, the shuttering can be pulled away without pulling the water stop away from the cast face of the concrete and of course, in all three cases, the water stop is not embedded in the concrete but is exposed across its rear face.

In a modification, the central portion of the water stop body portion 1 is arched to assume a generally hemi-cylindrical form the latter being of course open at the rear face. This permits the body portion 1 to be stretched somewhat in a transverse direction. The arching of the centre portion is of course in the same direction as that in which the keying formations project.

In our divisional application No. 21267/65 (Serial 1,008,812) there is claimed a water stop as hereinbefore described, in which the keying formations leave a marginal portion of the body through which nails may be driven whereby the water stop may be nailed to shuttering. Our divisional application also claims a concrete joint generally as claimed herein subject to the water stop having the aforementioned marginal portion, which is outboard of the keying formations, and it further claims a method of making such a concrete joint in which the water stop is nailed to shuttering at the requisite position through an edge portion along at least one edge of the water stop this edge portion being outboard of any keying formation.

WHAT WE CLAIM IS:—

1. A method of providing a water seal in cast concrete which comprises positioning a waterstop as hereinbefore described, flat on a base onto which concrete is to be cast, or securing the waterstop to the shuttering in the case of a generally vertical structure, and casting concrete sections so that a joint between the sections is positioned between keying formations of the waterstop, said keying formations becoming embedded in the concrete.

2. A waterstop which is in the form of a T-section 3. in which the marginal portion 4. claim body



2. A method according to claim 1 in which one at least of the keying formations is in the form of a flange or rib having in section the form of an inverted triangle, or a T-section.

3. A method according to claim 1 or 2, in which there are two pairs of keying formations arranged on opposite sides of the centre line of the strip-like body.

4. A method according to any preceding claim in which the face of the strip-like body opposite to that form which the key-

ing formation project is substantially devoid of projections.

5. A concrete joint having as a face thereof a waterstop as hereinbefore described, positioned with the keying formations of the waterstop embedded in the respective parts of the concrete whilst the outer face of the waterstop is not embedded in the concrete.

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