TIP-SEAL FOR PAVEMENT JOINTS

Inventor:

ALAN E. BRICKMAN,

by

JOHN E. JACKSON

his Attorney.
This invention relates to pavement joints, and more particularly to top seals therefor.
In the art of making pavement joints, it is customary to provide a filled element between the adjacent slabs of the pavement, to extend dowel elements between the adjacent slabs, and to form a top seal at the top of the joint and above the filler element.

A satisfactory top seal is essential to lasting performance of pavement joints. This means that the seal must flex with the cycle of movement caused by changes in temperature which expand or contract the pavement slabs and so increase or decrease the span at the joint. The top seal must either adhere or be in tight frictional contact with the ends of the pavement slabs at all times.

It has been found that few of the seals of the prior art satisfactorily perform their intended function over a substantial period of years. This failure in performance permits seepage of water which may freeze or cause setting of the dowel elements. Frequently there is puddling in the subgrade, which brings about a pumping action due to the flexure of the pavement under traffic load. A most serious condition, when the top seal fails, is infiltration of foreign materials, which defeats the designed purpose of the expansion joint.

The most commonly used type of top seal is tar, which is poured into the joints by maintenance crews. Expansion of the pavement in the summer compresses the tar, and it extrudes onto the surface of the pavement, causing a very undesirable condition. More recent top seals consist of moulded rubber or latex, which are also poured in place. The moulded rubber, which is compressed into the newly formed joint, gives satisfactory performance for a time. After a time, however, the rubber loses much of its elasticity and does not provide the desired seal. When a certain amount of elasticity is lost, the rubber seal may be drawn from its position in the joint by the suction exerted by automobile tires.

Latex, which is poured in place, is designed for the purpose of its adherence to the sides of the pavement slab. This adhesive quality generally fails after use for a year or two.

One of the objects of the present invention is to provide a top seal for pavement joints which will adhere to, or be in slight frictional contact with, the adjacent ends of the pavement slabs at all times.

Another object is the provision of a device of the class described which is easy and inexpensive to manufacture, and durable in service.

The invention, then, comprises the features hereinafter fully described and as particularly pointed out in the claims, the following description and the annexed drawing setting forth in detail a certain illustrative embodiment of the invention, this being indicative of one of the number of ways in which the principles of the invention may be employed.

In said drawing:
Figure 1 is a sectional elevation of the device of the present invention prior to its disposition in operative relationship.
Figures 2, 3 and 4 are sectional elevations of the device in its operative position and illustrating the manner in which it operates under normal, cold, and heated conditions, respectively.
Figure 5 is a fragmentary perspective illustrating the manner in which the device is installed.
Referring more particularly to the drawing, the numerals 1 and 2 designate the ends of adjacent pavement slabs between which there is disposed a filler element 4 which may be composed of any of the materials commonly used for this purpose.
The material of the filler element 4 is essentially one which is compressible, and for this purpose there has been satisfactorily used rubber, compressed corn stalks, etc.

Referring more particularly to Figure 1, it will be perceived that the upper end of the filler 4 terminates in spaced relationship from the top surfaces of the pavement slabs 2 and 3. In accordance with the teachings of the present invention, there is provided an inverted U-shaped element 6 which is composed of rubber or other suitable flexible material and which has along its upper edge a shallow concave longitudinally-extending trough 7. Between the edges of the shallow-concave longitudinally-extending trough 7 and the end faces of the inverted U-shaped member 6 are relatively short flat portions 8.

Disposed between the legs of the inverted U-shaped member 6 is a coextensive substantially V-shaped metallic member 10. The outer surfaces of the legs of the substantially V-shaped metallic member 10 contact the inner faces of the legs of the inverted U-shaped member 6. At their upper ends the legs of the substantially V-shaped member 10 are downwardly bent into convergent and convex portions 12 the extremities of which contact at substantially the neutral axis of the structure formed by all of the elements aforesaid.
The substantially V-shaped element 10 is made
of metal possessing resiliency and the inverted substantially U-shaped member 6 may be moulded with it in position, or the said substantially V-shaped element 10 may be subsequently inserted, as desired.

In Figure 2 there is illustrated the manner in which the top seal of the present invention is disposed with respect to the pavement slabs 2 and 3 during normal temperatures. In Figure 3 there is illustrated the manner in which the seal of the invention functions at warm temperatures. From this figure it will be perceived that the pavement slabs 2 and 3 are expanded, thereby causing compression of the top seal.

In Figure 4 there is illustrated a cold temperature condition wherein the pavement slabs 2 and 3 are contracted, whereby the top seal is caused to stretch across the expansion joint in a manner exceeding that of the normal installation of Figure 2.

Referring more particularly to Figure 5, there is shown means for compressing the assembly composed of the inverted substantially U-shaped rubber member 6 and the V-shaped metallic spring element 10 in the recess provided at the upper ends of the pavement slabs 2 and 3 and atop the filler element 4. This means is composed of light-gauge sheet metal sides 15 which are used to line the adjacent faces of the pavement slabs. These side plates 15 are longitudinally stiffened and supported on either side by an angle 16 which rests on the surface of the pavement. The top seal assembly is then forced by pressure or driving into the recess provided by the upper portions of the slab sections 2 and 3 and atop the filler element 4.

While I have shown and described one specific embodiment of the present invention, it will be seen that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of the invention as defined in the appended claims.

I claim:

1. A top seal for pavement joints comprising a preformed sealing member of resilient material, said member having an inverted U-shaped cross-section including spaced depending legs, an upright substantially V-shaped spring inserted within the sealing member and having spring legs engaging the legs of the sealing member, said spring legs having inwardly and downwardly returned terminal spring portions, said sealing member and spring being adapted to be compressed transversely in assembled relation, whereby the terminal spring portions are engaged and with the spring legs exert an outward pressure upon the sealing member legs.

2. A top seal for joints between adjacent preformed paving slabs comprising a preformed sealing member of resilient material having an upper edge portion and spaced depending legs, the outer faces of said legs being conformable to the end faces of the slabs for intimate contact with the latter upon insertion of the sealing member therebetween, an upright substantially V-shaped spring inserted within and extending substantially throughout the sealing member between the legs thereof, said spring having resilient legs engaging and exerting an outward expensive pressure upon said sealing member legs, and additional spring means disposed between the spring legs and coating therewith to expand the sealing member upon transverse compression of the assembled member and spring.

ALAN E. BRICKMAN.