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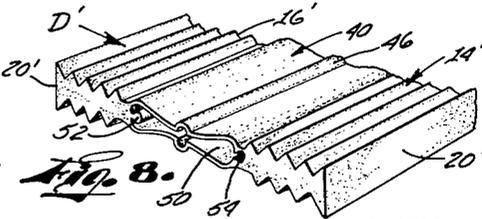
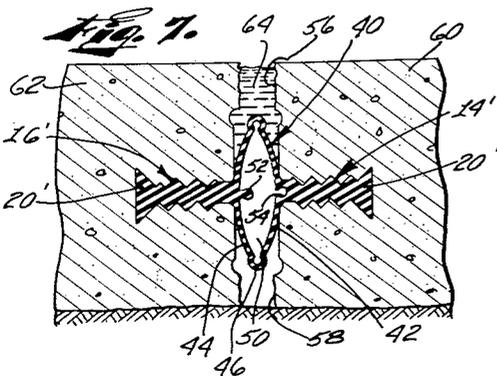
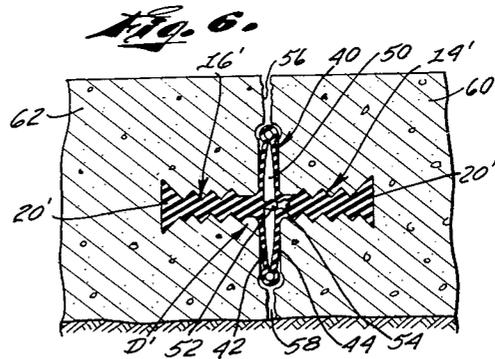
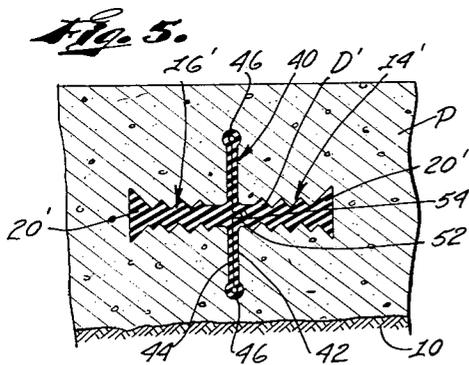
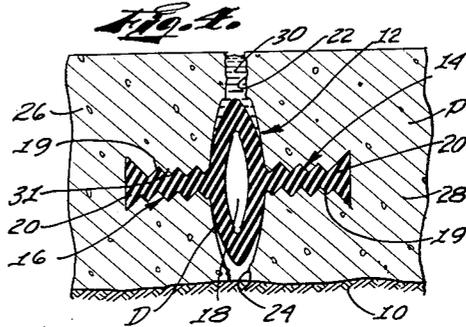
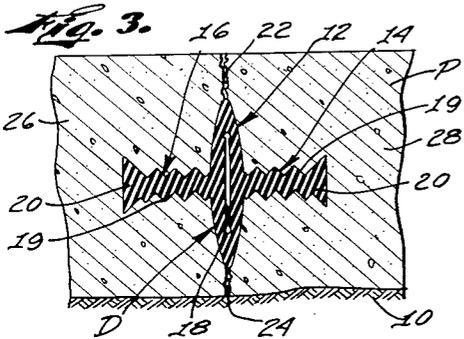
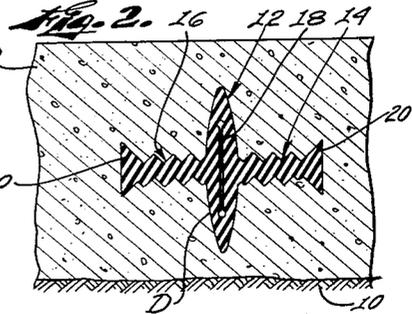
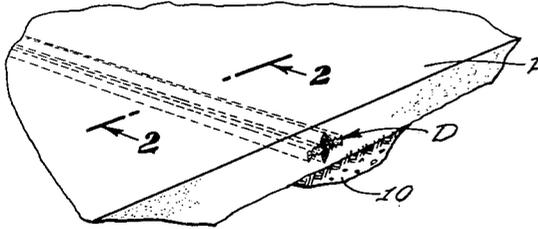
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COMBINED WEAKENED PLANE JOINT FORMER AND WATERSTOP

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Fig. 1.



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COMBINED WEAKENED PLANE JOINT FORMER AND WATERSTOP

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The present invention relates generally to the field of construction and more particularly to the forming and sealing of weakened plane joints in a paved surface.

In the construction of paved roads, airport runways and the like, it is common to tamp transversely extending separator strips at longitudinally spaced points in the uncured paving material. These separator strips serve to define weakened plane joints in the paving material, contraction of the paving material as it cures and hardens causing it to crack at each of the weakened plane joints. If such weakened plane joints are not provided the pavement would be damaged by the uncontrolled cracking which would otherwise occur during its contraction. In addition to the use of such separator strips for forming weakened plane joints, it has been heretofore proposed to saw vertical slots in the paving material prior to the time it undergoes final contraction. During final contraction, the paving material below the saw cut will fracture so as to form the weakened plane joint.

After a weakened plane joint has been formed, it is necessary by a separate operation to force a sealing compound downwardly thereinto. Such sealing compound restrains the downward flow of water through the weakened plane joint. Unless such downward flow is prevented, water will accumulate beneath the pavement slabs on either side of the joint and as the slabs undergo vertical movement due to the weight of the vehicles passing thereover, the water will gradually wash out the road bed. Additionally, in colder climates the water will freeze with consequent damage to the paving material.

It is a major object of the present invention to provide a combined weakened plane joint former and waterstop device which may be substituted for the heretofore-proposed arrangements of forming and sealing weakened plane joints.

Another object is to provide a device of the aforedescribed nature which is more economical in use than the heretofore-proposed weakened plane joint forming and sealing arrangements.

A more particular object is to provide a device of the aforedescribed nature which includes an elongated, vertically extending band and a horizontally extending sealing strip connected to each side of the band, which device is adapted to be embedded in an uncured paving section and extending thereacross, the pavement fracturing in vertical alignment with the band as it cures so as to define a weakened plane joint, whereafter the two sealing strips cooperate with the paving material slabs on either side of the joint to restrain the downward flow of water through the joint.

It is yet a further object of the present invention to provide a combined weakened plane joint former and waterstop device of the aforedescribed nature which will effectively seal the joint even where the slabs on either side thereof undergo extensive movement in opposite directions.

Another object of the present invention is to provide a combined weakened plane joint former and waterstop device of the aforedescribed nature which may be economically packaged for shipping, storing and handling.

An additional object is to provide a novel waterstop device incorporating a unique sealing strip.

These and other objects and advantages of the present

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invention will become apparent from the following detailed description, when taken in conjunction with the appended drawings wherein:

FIGURE 1 is a perspective view showing a combined weakened plane joint former and waterstop device embodying the present invention embedded in an uncured paving section;

FIGURE 2 is an enlarged vertical sectional view taken on line 2-2 of FIGURE 1;

FIGURE 3 is a second view taken along line 2-2 but showing the manner whereby said device forms a weakened plane joint across said paving section;

FIGURE 4 is a view similar to FIGURE 3 showing how said device functions as a waterstop;

FIGURE 5 is a vertical sectional view showing a second form of combined weakened plane joint former and waterstop device embodying the present invention embedded in an uncured paving section;

FIGURE 6 is a view similar to FIGURE 5 showing the manner said device forms a weakened plane joint across said paving section;

FIGURE 7 is another view similar to FIGURE 5 showing how said device will continue to act as a waterstop even after considerable relative movement of the slabs on either side of the joint in opposite directions; and

FIGURE 8 is an enlarged perspective view showing how said second form of device may be collapsed for shipping, storing and handling.

Referring to the drawings, the first form of combined weakened plane joint former and waterstop device D embodying the present invention is shown embedded in an uncured paving section P. The device D is of elongated configuration and in practice it may be retained in its position of FIGURE 1 by suitable means (not shown) as the paving material is poured around it. The paving section P rests upon a roadbed or other generally horizontal base 10.

Referring now to FIGURE 2, the combined weakened plane joint former and waterstop device D includes an elongated, vertically extending band member, generally designated 12, and a pair of horizontally extending sealing strips, generally designated 14 and 16, that are connected to each side of the band 12. The upper portion of band 12 tapers upwardly for a distance greater than the thickness of the band to provide a continuous upper straight edge while the lower portion of the band tapers downwardly for a distance greater than the thickness of the band to provide a continuous straight edge at the lower end of the band. Preferably, the device D is formed of a resilient material, as for example a suitable synthetic plastic such as polyvinyl chloride. The band 12 is preferably of hollow, generally bulbular configuration having a central air space 18. The strips 14 and 16 are identical and are integral with the band 12. Preferably, these strips 14 and 16 are serrated to define longitudinal ribs 19 and are formed at their free ends with an enlarged anchor element 20. These anchor elements 20 become firmly embedded within the paving material when the latter cures.

Referring now to FIGURE 3, at such time as the paving material of section P cures and thus undergoes contraction, this paving material will fracture in vertical alignment with the band so as to form upper and lower slots indicated at 22 and 24, respectively. In this manner, the device D serves to form a weakened plane joint interposed between two adjoining slabs 26 and 28 created thereby in the paving section P.

Referring now to FIGURE 4, at such times as the slabs 26 and 28 undergo relative movement away from one another, the aforedescribed device D will serve as an effective waterstop. In this regard, the water 30 entering the slot 22 above the band 12 will not be able to

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flow downwardly past the sealing strips 14 and 16 inasmuch as the ribs 19 thereof will cooperate with the ridges 31 formed in the paving material wherein they are embedded to prevent any percolation of such water outwardly along the sealing strips. It should be particularly observed that the greater the relative separation between the slabs 26 and 28, the tighter the seal between the sealing strips 14 and 16 and the paving material wherein they are embedded. This is true because the ribs 19 of these sealing strips will be pulled into tight engagement with the pointed ridges 34 of the paving material. It should also be observed that the provision of the enlarged anchor elements 20 of the sealing strips 14 and 16 reduce the possibility that these strips will become loosened from the paving material P during relative movement between the slabs 26 and 28. As clearly indicated in this figure, the band 12 will under go horizontal expansion normal to its longitudinal axis as the slabs 26 and 28 move away from one another.

Referring now to FIGURES 5 and 8, there is shown a second form of combined weakened plane joint former and water stop device D' embodying the present invention. This second form of device D' is generally similar to the first form D, except for the shape of its band member, generally designated 40. The sealing strips 14' and 16', however, may be identical with their counterparts 14 and 16 of the first form of device D, as will be apparent from the drawings.

The band member 40 of the second form of device D' includes a pair of generally vertically extending, flexible side walls 42 and 44 which are integrally joined along their upper and lower ends by a semi-circular closure bead 41. The side walls 42 and 44 define a central air space 50. The aforementioned sealing strips 14' and 16' are integrally connected to the midportion of the side walls 42 and 44. The midportion of one of the side walls 44 is formed with a male button member 52 that extends towards the opposite side wall 42. This button member 52 is adapted to be received by a complementary female socket 54 centrally formed along the side wall 52 and partially extending into the sealing strip 14'. The button member 52 and the socket 54 cooperate to form readily disengageable fastener means between the side walls 42 and 44.

Referring now to FIGURE 6, at such time as the paving material of section P cures and thus undergoes contraction, this paving material will fracture in vertical alignment with the band 14 so as to form upper and lower slots 56 and 58. In this manner the device D' serves to form a weakened plane joint interposed between two adjoining slabs 60 and 62. During such contraction of the paving material, the button member 52 may become withdrawn from the socket 54.

Referring now to FIGURE 7, at such time as the slabs 60 and 62 undergo relative movement away from one another, the device D' will serve as an effective waterstop to prevent any water 64 entering the upper slot 56 from flowing downwardly past the sealing strips 14' and 16' in the manner described hereinabove with regard to the first form of device D. It should be particularly noted that during any extensive relative movement of the slabs 60 and 62 in opposite directions, the button member 52 will be pulled from the slot 54. The flexibility of the sidewalls 42 and 44 permits even extensive relative movement of the slabs 60 and 62 in opposite directions to take place without damage to the device D'. This is particularly advantageous where the slabs 60 and 62 undergo unplanned movement in opposite directions relative to one another.

Referring now to FIGURE 8, it is a particular feature of the second form of device D' that the band 40 may be collapsed to a substantially horizontally extending configuration at such time as the button member 52 is withdrawn from the socket 54. This permits the device D' to be formed into a roll as shown in this figure

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so as to facilitate its shipping, storing and handling. When the device D' is to be employed at the job site, the proper length is cut from the roll and thereafter the button member 52 is inserted within the socket 54.

It will be apparent from the foregoing description that a combined weakened plane joint former and waterstop device constructed in accordance with the present invention will afford many advantages over the heretofore proposed arrangements for forming and sealing weakened plane joints. It will also be apparent that various modifications and changes may be made with regard to the foregoing detailed description without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. In a paving section, a weakened plane joint, comprising: an elongated vertically extending paving fracturing band of lesser height than the depth of said paving section, said band having its upper portion tapering upwardly for a distance greater than the thickness of said band to provide a continuous straight edge below the upper surface of said paving section, said band having its lower portion tapering downwardly for a distance greater than the thickness of said band to provide a continuous straight edge disposed above the lower surface of said paving section whereby said paving section undergoes fracturing in vertical alignment with the upper and lower edges of said band as said paving cures so as to define said weakened plane joint across said paving section; and a horizontally extending sealing strip integrally connected to each side of said band, said strips each being formed with longitudinally extending serration means that are firmly embedded within said paving as said paving cures, said sealing strips cooperating with the paving section on either side of said weakened plane joint to restrain the downward flow of water through said joint, said paving fracturing band and said sealing strips being formed of resilient material whereby relative movement is permitted between the portions of said paving section on either side of said weakened plane joint.

2. In a paving section, a weakened plane joint, comprising: an elongated vertically extending paving fracturing band of hollow, generally bulbular configuration, having a central air space, said band being of lesser height than the depth of said paving section, said band having its upper portion tapering upwardly for a distance greater than the thickness of said band to provide a continuous straight edge below the upper surface of said paving section, said band having its lower portion tapering downwardly for a distance greater than the thickness of said band to provide a continuous straight edge disposed above the lower surface of said paving section whereby said paving section undergoes fracturing in vertical alignment with the upper and lower edges of said band as said paving cures so as to define said weakened plane joint across said paving section; and a horizontally extending sealing strip integrally connected to each side of said band, said strips each being formed with longitudinally extending serration means that are firmly embedded within said paving as said paving cures, said sealing strips cooperating with the paving section on either side of said weakened plane joint to restrain the downward flow of water through said joint, said paving fracturing band and said sealing strips being formed of resilient material whereby relative movement is permitted between the portions of said paving section on either side of said weakened plane joint.

3. In a paving section, a weakened plane joint, comprising: an elongated vertically extending paving fracturing band of lesser height than the depth of said paving section, said band having its upper portion tapering upwardly for a distance greater than the thickness of said band to provide a continuous straight edge below the upper surface of said paving section, said band having its lower portion tapering downwardly for a distance greater than the thickness of said band to provide a continuous straight edge disposed

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above the lower surface of said paving section whereby said paving section undergoes fracturing in vertical alignment with the upper and lower edges of said band as said paving cures so as to define said weakened plane joint across said paving section, said fracturing band being defined by a pair of side walls joined along their upper and lower edges so as to define a hollow air space therebetween, with readily disengagable fastener means being interposed between said side walls; and a horizontally extending sealing strip integrally connected to each side of said band, said strips each being formed with longitudinally extending serration means that are firmly embedded within said paving as said paving cures, said sealing strips cooperating with the paving section on either side of said weakened plane joint to restrain the downward flow of water through said joint, said paving fracturing band and said sealing strips being formed of resilient material

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whereby relative movement is permitted between the portions of said paving section on either side of said weakened plane joint.

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