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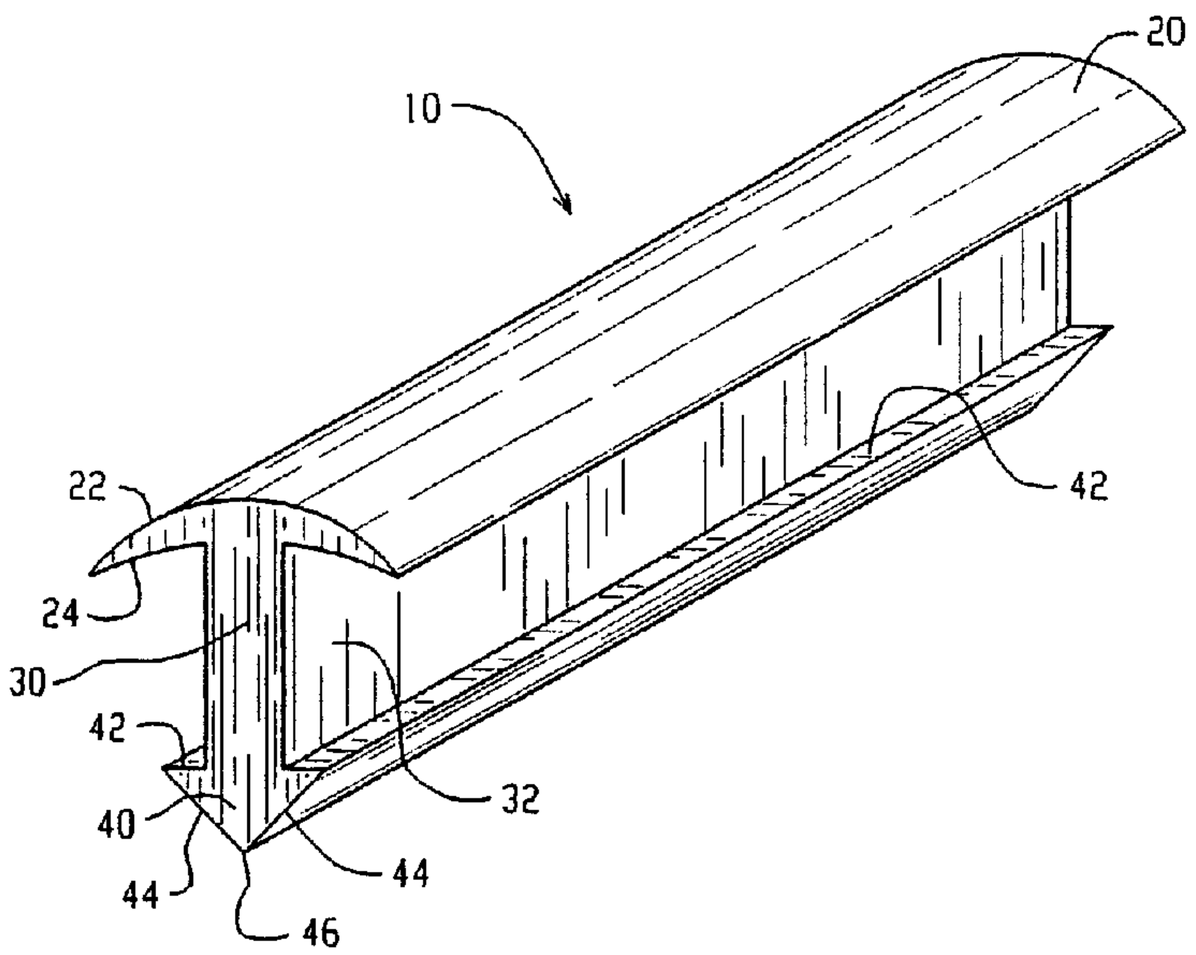
(54) Titre : GARNITURE DE JOINT DE DILATATION
(54) Title: EXPANSION JOINT CAP



(57) Abrégé/Abstract:
A unitary resilient expansion joint insert member is provided for insertion into the expansion joint between adjacent concrete floor slabs. Such member is of substantially-constant transverse cross-section for filling an expansion joint gap which is formed between adjacent concrete flooring slabs. The insert member consists essentially of a cap portion having a convexly curved upper surface and a concavely curved lower surface. The lower surface of the cap portion forms a substantially-planar surface, which is generally parallel, and adjacent, to the surface of the adjacent concrete slabs, when the insert member is arranged in the expansion joint. A projection portion which is integral with the cap portion extends downwardly from the lower surface of the cap portion to a lower end. The projection member consists of parallel, planar opposed walls extending perpendicularly to the lower surface of the cap and an anchor portion having a pair of horizontal planar surfaces. Each horizontal surface extends perpendicularly to and in opposite directions from, the walls, to respective outer edges. The anchor portion also has planar angle surfaces extending respectively from the outer edges of the horizontal surfaces to a common point at the lower end of the projection members. The walls and the anchor portion have the shape of an arrow. The resilience of the cap portion provides a slight upward force on the projection member to exert a positive, engaging force that tends to lock the projection member in the gap.

Abstract

A unitary resilient expansion joint insert member is provided for insertion into the expansion joint between adjacent concrete floor slabs. Such member is of substantially-constant transverse cross-section for filling an expansion joint gap which is formed between adjacent concrete flooring slabs. The insert member consists essentially of a cap portion having a convexly curved upper surface and a concavely curved lower surface. The lower surface of the cap portion forms a substantially-planar surface, which is generally parallel, and adjacent, to the surface of the adjacent concrete slabs, when the insert member is arranged in the expansion joint. A projection portion which is integral with the cap portion extends downwardly from the lower surface of the cap portion to a lower end. The projection member consists of parallel, planar opposed walls extending perpendicularly to the lower surface of the cap and an anchor portion having a pair of horizontal planar surfaces. Each horizontal surface extends perpendicularly to and in opposite directions from, the walls, to respective outer edges. The anchor portion also has planar angle surfaces extending respectively from the outer edges of the horizontal surfaces to a common point at the lower end of the projection members. The walls and the anchor portion have the shape of an arrow. The resilience of the cap portion provides a slight upward force on the projection member to exert a positive, engaging force that tends to lock the projection member in the gap.

(a) TITLE OF THE INVENTION

EXPANSION JOINT CAP

(b) TECHNICAL FIELD TO WHICH THE INVENTION RELATES

The present invention relates generally to an insert member, and more particularly to an expansion joint cap insert member for sealing a gap in a concrete expansion joint.

(c) BACKGROUND ART

When a concrete flooring surface is installed, a gap is ordinarily left between adjacent slabs of concrete. These gaps allow the concrete slabs room to move due to settling of a structure, and to expand and contract due to environmental temperature changes.

A typical concrete flooring surface consists of concrete slabs of large dimensions, e.g., by 30 x 30 feet square. Each slab is separated from adjacent slabs by a gap of ½ inch. To provide a finished flooring surface, a flooring material, e.g., vinyl or rubber tile, is applied to the surface of the concrete slabs with the edges of the tiles even with the edges of the concrete slabs at each edge of the expansion joint. When adjacent concrete slabs contract, they separate, and they will carry the tile which is adhered thereto with them. If tile were laid over the crack, e.g., where it is filled with caulking, the tile will crack (it should not crack if it were laid up to the edge of crack of the flooring surface). Accordingly, the gap between the concrete slabs will also increase, thus causing a gap to appear between adjacent tiles applied to respective adjacent slabs of concrete. The ground may appear in the enlarged gap between the concrete slabs. In some cases, the exposed ground and enlarged gap may violate health codes. When adjacent concrete slabs expand and move closer together, the tiles adhered thereto may become damaged. In this respect, tiles which are adhered to adjacent concrete slabs may chip, crack, break or come unadhered from the concrete slab, as the tiles from adjacent slabs push against each other.

(d) DESCRIPTION OF THE INVENTION

In view of the foregoing problems, there is a need for a device which can fill the gap between adjacent concrete slabs and prevent exposure of the gap and the underlying ground

when adjacent concrete slabs move further apart, and for maintaining a generally continuous flooring surface when adjacent concrete slabs move closer

It is an object of a first aspect of the present invention to provide an expansion joint cap for use in the joint between adjacent concrete flooring slabs, for enabling the movement of the slabs under the top of the cap.

It is an object of a second aspect of the present invention to provide an expansion joint cap insert member for providing a continuous flooring surface between adjacent concrete slabs.

It is an object of a third aspect of the present invention to provide an expansion joint cap insert member which is easily installed in the gap between adjacent concrete slabs.

It is an object of a fourth aspect of the present invention to provide an expansion joint cap insert member which provides a seal between flooring materials which have been applied to adjacent concrete slabs.

It is an object of a fifth aspect of the present invention to provide an expansion joint cap insert member which substantially prevents chipping and cracking of flooring material which have been applied to the surface of adjacent concrete slabs.

It is an object of a sixth aspect of the present invention to provide an expansion joint cap insert member which covers the flooring materials which have been applied to adjacent concrete slabs when the adjacent concrete slabs move further from each other, as during settling or thermal contraction, which could cause buckling of the flooring materials.

It is an object of a seventh aspect of the present invention to provide an expansion joint cap insert member which covers flooring material which have been applied to adjacent concrete slabs, which have become damaged, e.g., by cracking, due to a narrowing of the gap between adjacent concrete slabs, as during thermal expansion.

It is an object of a eighth aspect of the present invention to provide an expansion joint cap insert member which sufficiently covers the gap between two adjacent concrete slabs so that the gap remains concealed when the gap widens due to settling or thermal expansion.

An object of a ninth aspect of the invention is to provide a joint cap which can be retrofitted into a damaged seam in concrete flooring slabs having tiles on them to hide damage done to the slab and to the tiles, and to allow for further movement of one slab

relative to another slab, or part of the slab relative to another part of the slab on opposite sides of a seam.

The present invention, in a broad aspect, provides a unitary, elongated resilient insert member of substantially constant transverse cross-section for filling an expansion joint gap formed between adjacent concrete flooring slabs. The insert member consists essentially of a cap portion having a convexly curved upper surface and a concavely curved lower surface, the lower surface of the cap portion forming a substantially-planar surface which is generally parallel, and adjacent to, the surface of the adjacent concrete slabs, when the insert member is arranged in the expansion joint. The insert member also includes a projection portion which is integral with the cap portion, extends downwardly from the lower surface of the cap portion to a lower end. The projection member consists of parallel, planar opposed walls extending perpendicularly to the lower surface of the cap, and an anchor portion having a pair of horizontal planar surfaces, each horizontal surface extending perpendicularly to, and in opposite directions from, the walls, to respective outer edges, and planar angle surfaces extending respectively from the outer edges of the horizontal surfaces to a common point at the lower end of the projection members, the walls and the anchor portion having the shape of an arrow. The resilience of the cap portion provides a slight upward force on the projection member to exert a positive, engaging force that tends to lock the projection member in the gap.

According to a preferred embodiment of the present invention, an elongated resilient insert member is provided of substantially constant transverse cross-section for filling an expansion joint gap formed between adjacent concrete slabs. The insert member includes a cap portion having a curved upper surface and a curved lower surface, and a projection member extending downwardly from the lower surface of the cap portion. The cap portion preferably has a mushroom shape. The projection member includes a pair of generally-planar parallel walls, the walls being generally perpendicular to the lower surface of the cap. The projection member preferably terminates in a portion having a triangular cross-section with a downward facing cross-section, shaped like an arrowhead. The walls and lower portion thus preferably are shaped like an arrow. The arrow portion is compressed as adjacent slabs expand to narrow the gap between them. The compression is relieved

when the slabs contract. The tiles or other flooring surface move beneath the mushroom cap as the slabs expand and contract.

(e) DESCRIPTION OF THE FIGURES

In the accompanying drawings:

FIG. 1 is a perspective view of an expansion joint insert member illustrating a preferred embodiment of one aspect of the present invention.

FIG. 2 is a cross-sectional view of the insert member shown in FIG. 1.

FIG. 3 is a cross-sectional view of the insert member shown in FIG. 1 as arranged within a gap between two adjacent concrete slabs having flooring surface materials which have been applied thereto.

(f) AT LEAST ONE MODE FOR CARRYING OUT THE INVENTION

Referring now to the drawings, wherein the drawings are for the purpose of illustrating a preferred embodiment of an aspect of the invention, and not for the purpose of limiting the same, FIG. 1 shows an expansion joint insert member 10 according to a preferred embodiment of an aspect of the present invention. In the embodiment shown, insert member 10 is a resilient elongated strip which is made of an extruded vinyl or rubber material. Preferably, insert member 10 is made of an extruded thermoplastic material, e.g., polyvinyl chloride (PVC).

Insert member 10 is generally comprised of a cap portion 20 and a projection member 30. Cap portion 20 is generally comprised of an upper surface 22 and a lower surface 24. Before insert member 10 is placed in the gap between adjacent concrete slabs, the upper surface 22 is a convexly curved surface, while the lower surface 24 is a concavely curved surface, Cap portion 20 can be referred to as a mushroom cap.

Projection member 30 is generally comprised of side walls 32 and a tooth or arrowhead portion 40. Side walls 32 have a generally-planar surface, and extend downwardly from the lower surface 24 of cap portion 20. An anchor, tooth or arrowhead portion 40 is formed at the lower end of side walls 32. Tooth portion 40 is comprised of a

pair of outwardly-extending horizontal sections 42 and a pair of angle sections 44. Horizontal sections 42 are generally perpendicular to side walls 32. Angle sections 44 have a generally-planar surface. Each angle section 44 extends from the outermost edge of horizontal section 42 to a tip 46. Projection member 30 and tooth portion 40 can jointly be referred to the arrow part of member 10.

Referring now to FIG. 3, concrete slabs 50 are formed adjacent to each other with a gap 52 provided therebetween. Gap 52 typically has a width of 1/8-inch to 1/4-inch. Flooring materials 60 (e.g., vinyl or rubber tile) are adhered to the top surface of slabs 50 providing an extension of gap 52. Gap 52 is provided to allow for thermal expansion and contraction of concrete slabs 50, as well as movement of concrete slabs 50 due to settling.

Insert member 10 is engaged between slabs 50 and flooring material 60 by pounding insert member 10 into gap 52. The arrow part of insert member 10 is

fully engaged between slabs 50 and flooring 60, and slabs 50 expand. This expansion compresses the arrow including projection member 30 and tooth portion 40, and renders lower surface 24 of cap portion 20 flush against the top surface of flooring 60. The resilience of insert member, and in particular the resilience of cap portion 20, allows cap portion 20 to spread outward as lower surface 24 meets with the upper surface of flooring 60. When insert member 10 is fully engaged, lower surface 24 will be flexed to form a generally planar surface substantially parallel to the top surface of flooring 60. The resilience of cap portion 20 provides a slight upward force on projection member 30 to exert a positive, engaging force that tends to lock projection member 30 in gap 52. Importantly, cap portion 20 extends outward from gap 52 to cover the portions of flooring 60 which meet the edge of gap 52. In most cases involving new construction, flooring 60 extends up to, but not across, the gap between slabs 50.

When slabs 50 contract, the slabs move away from projection member 30, although they usually remain engaged with anchor portion 40. There may be an air space between projection member 30 and the vertical edges of slabs 50. The flooring surface slides beneath the mushrooms or cap 20 as the slabs expand and contract.

Horizontal portions 42 of tooth portion 40 extend outward from the surfaces of side walls 32 a sufficient distance to engage with the side walls of concrete slabs 50. Angle sections 44 allow for easy installment of insert member 10 within gap 52. While the shape and size of angle sections 44 allow for easy installation, the shape and size of horizontal portion 42 provides a secure, tight fit within gap 52 and prevents easy removal of insert member 10 therefrom.

The length of insert member 10 may vary. In this regard, insert member 10 may be provided in units of varying length and cut to a size required in a particular situation. However, it will be appreciated that a length of 5, 10, 12, 15 or 30 feet may be preferred, since concrete slabs are typically formed with dimensions of 30 feet x 30 feet, although 12 foot lengths are the usual dimensions for extrusions in flooring materials.

The preferred dimensions of insert member 10 will now be described with reference to FIGS. 2 and 3. Referring to tooth portion 40 shown in FIG. 2, width

dimension A is 0.375 inches, while width dimension B between distal ends of horizontal sections 42 is 0.75 inches. Height dimension C from the centre of upper surface 22 of cap portion 20 to tip 46 is 1.69 inches. Side walls 32 have a preferred height dimension D of 1.125 inches.

With reference now to FIG. 3, the height dimension E, from lower surface 24 to tip 46, is 1.5 inches. Width dimension F of cap portion 20 is 1.5 inches. It should be noted that the dimensions shown with reference to FIG. 3, are determined with insert member 10 fully engaged between slabs 50 and flooring materials 60. Accordingly, due to the resilient nature of insert member 10, cap portion 20 is spread out such that lower surface 24 is flush against flooring materials 60. Therefore, dimensions E and F will differ when cap portion 20 is not engaged. In particular, dimensions E and F will be reduced when cap portion 20 is disengaged from gap 52.

It should be appreciated that the foregoing dimensions are for a preferred embodiment only, and that any one of the dimensions may be varied to adapt insert member 10 for a particular situation.

As noted above, the present invention, in its broad aspects, provides an expansion joint cap insert member for filling the gaps or seams between concrete slabs to make unnoticeable the shifting of concrete slabs of floors unnoticeable. The concrete slabs may move apart due to the settling of a building or due to thermal contraction. Accordingly, the insert members of broad aspects of the present invention are driven into the gap between the slabs to cover the flooring materials after they have moved apart. In contrast, if the concrete slabs move closer together due to settling or thermal expansion, the insert member of aspects of the present invention will be compressed and prevent chipping, buckling or otherwise damaging flooring material, as well as making any changes to the condition of the flooring material unnoticeable.

In some instances gaps may form in slabs as the slab has shifted, which could damage tiles located on the slab. Gaps could also form in a slab which has cracked, when the slab had tiles positioned on the slab. Likewise, slabs which expand against each other, or parts of a slab on opposite sides of a seam, could expand against or butt against each other. The slabs or parts of slabs which

initially butt against each other could contract and form a gap. The foregoing gaps can be cleaned out, and expansion joint caps according to the invention could be retrofitted into the gaps to hide the damage and still enable further movement between contiguous slabs or parts of a slab.

It should be appreciated that the insert member of the present invention can be made of various colors so that they match or harmonize with existing colored flooring materials.

Claim

1. A unitary, elongated resilient insert member of substantially-constant transverse cross-section for filling an expansion joint gap which is formed between adjacent concrete flooring slabs, said insert member consisting essentially of:

a cap portion having a convexly curved upper surface and a concavely curved lower surface, said lower surface of said cap portion forming a substantially-planar surface which is generally parallel, and adjacent to, the surface of said adjacent concrete slabs, when said insert member is arranged in said expansion joint; and

a projection portion which is integral with said cap portion extending downwardly from the lower surface of said cap portion to a lower end, said projection member consisting of parallel, planar opposed walls extending perpendicularly to said lower surface of said cap, and an anchor portion having a pair of horizontal planar surfaces, each horizontal surface extending perpendicularly to, and in opposite directions from, said walls, to respective outer edges, and planar angle surfaces extending respectively from the outer edges of the horizontal surfaces to a common point at the lower end of said projection members, said walls and said anchor portion having the shape of an arrow;

wherein the resilience of said cap portion provides a slight upward force on said projection member to exert a positive, engaging force that tends to lock said projection member in said gap.

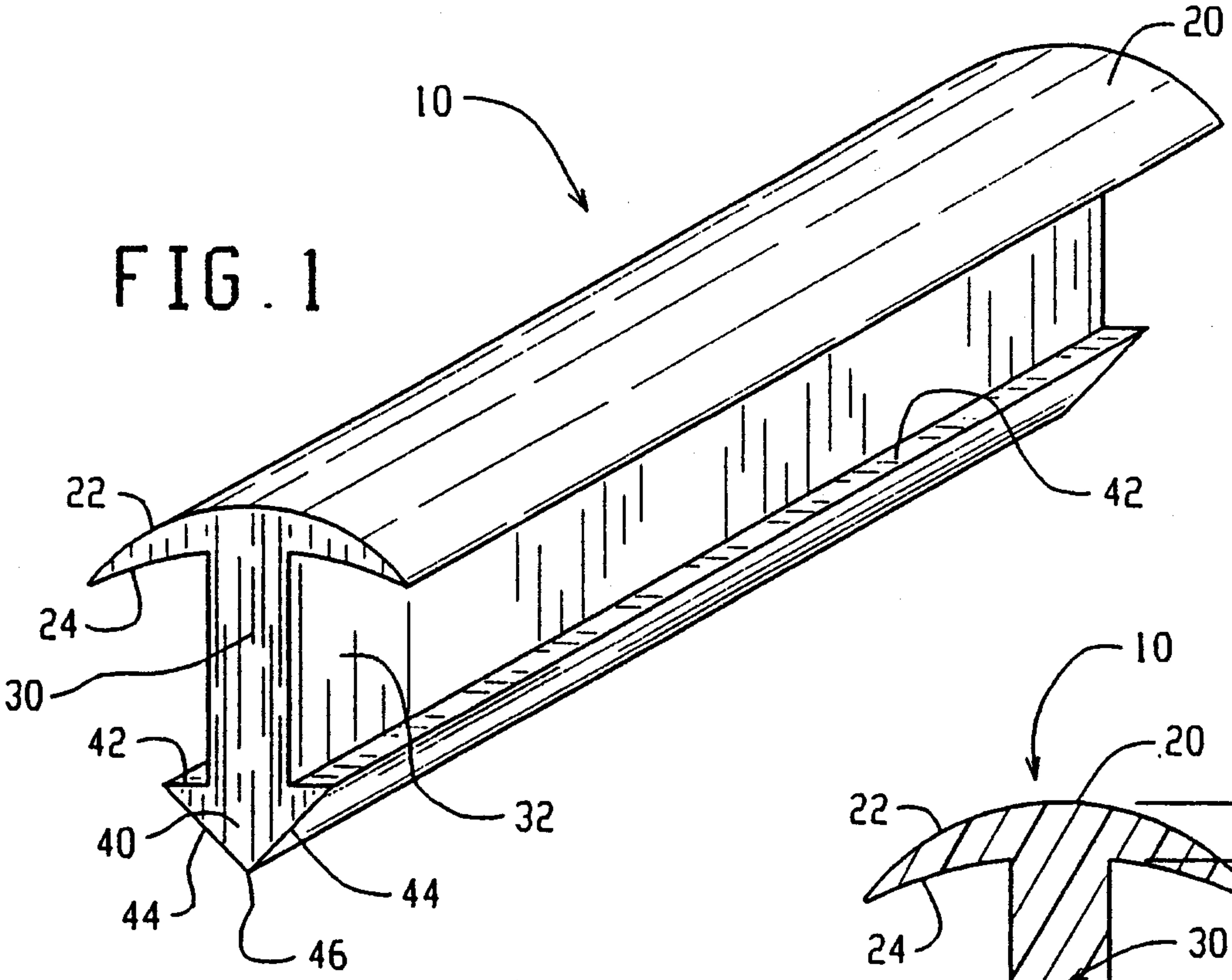


FIG. 1

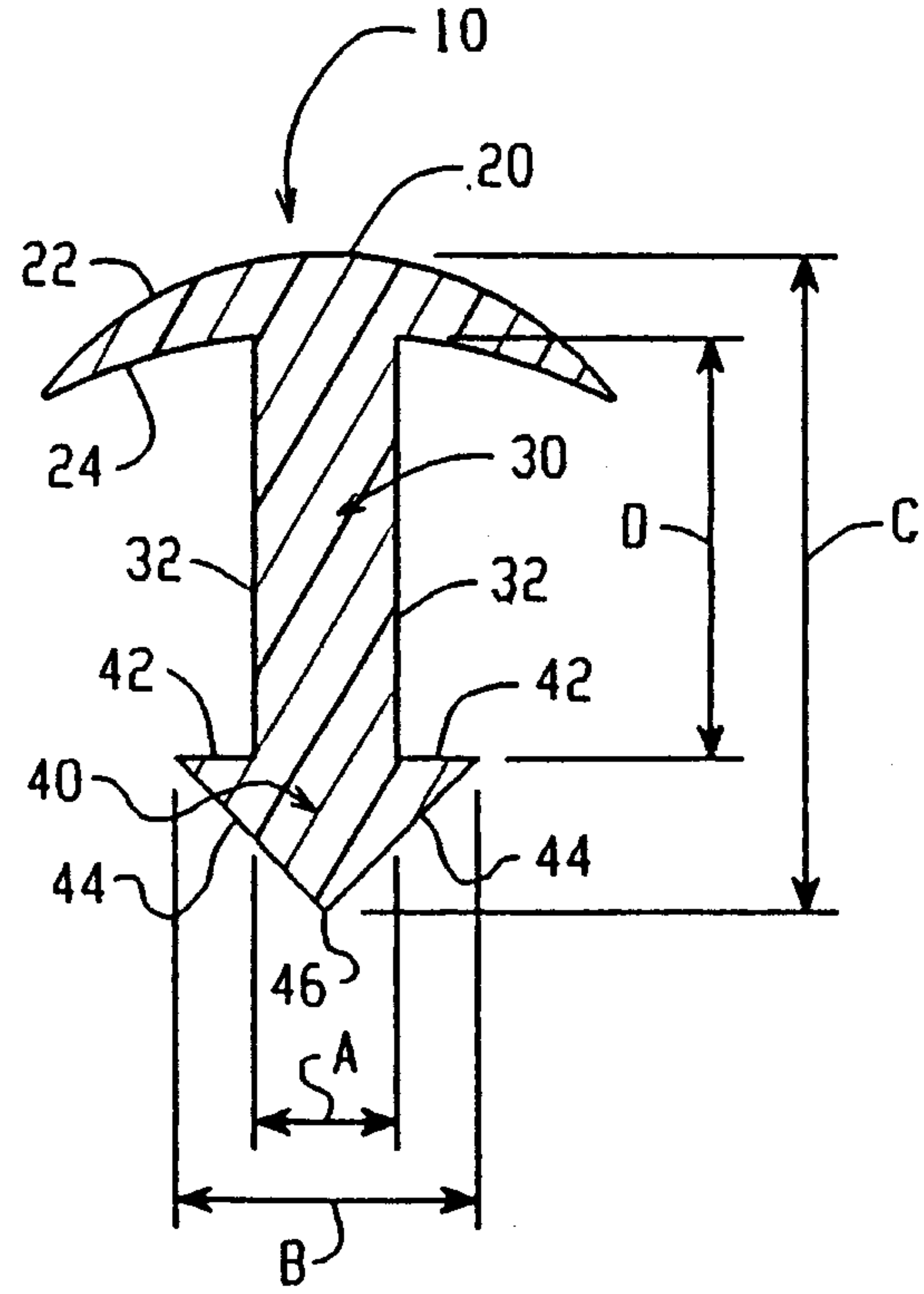


FIG. 2

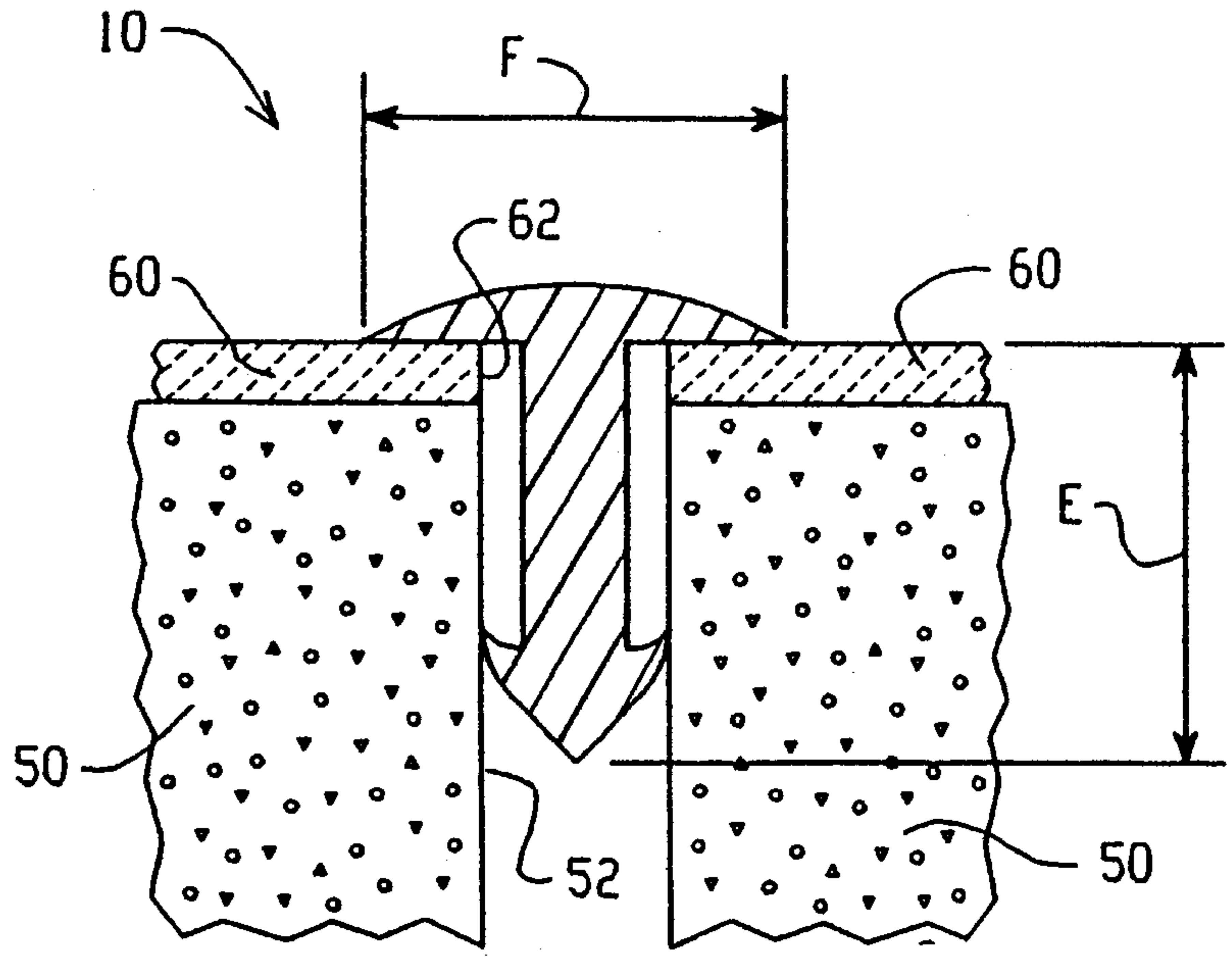


FIG. 3

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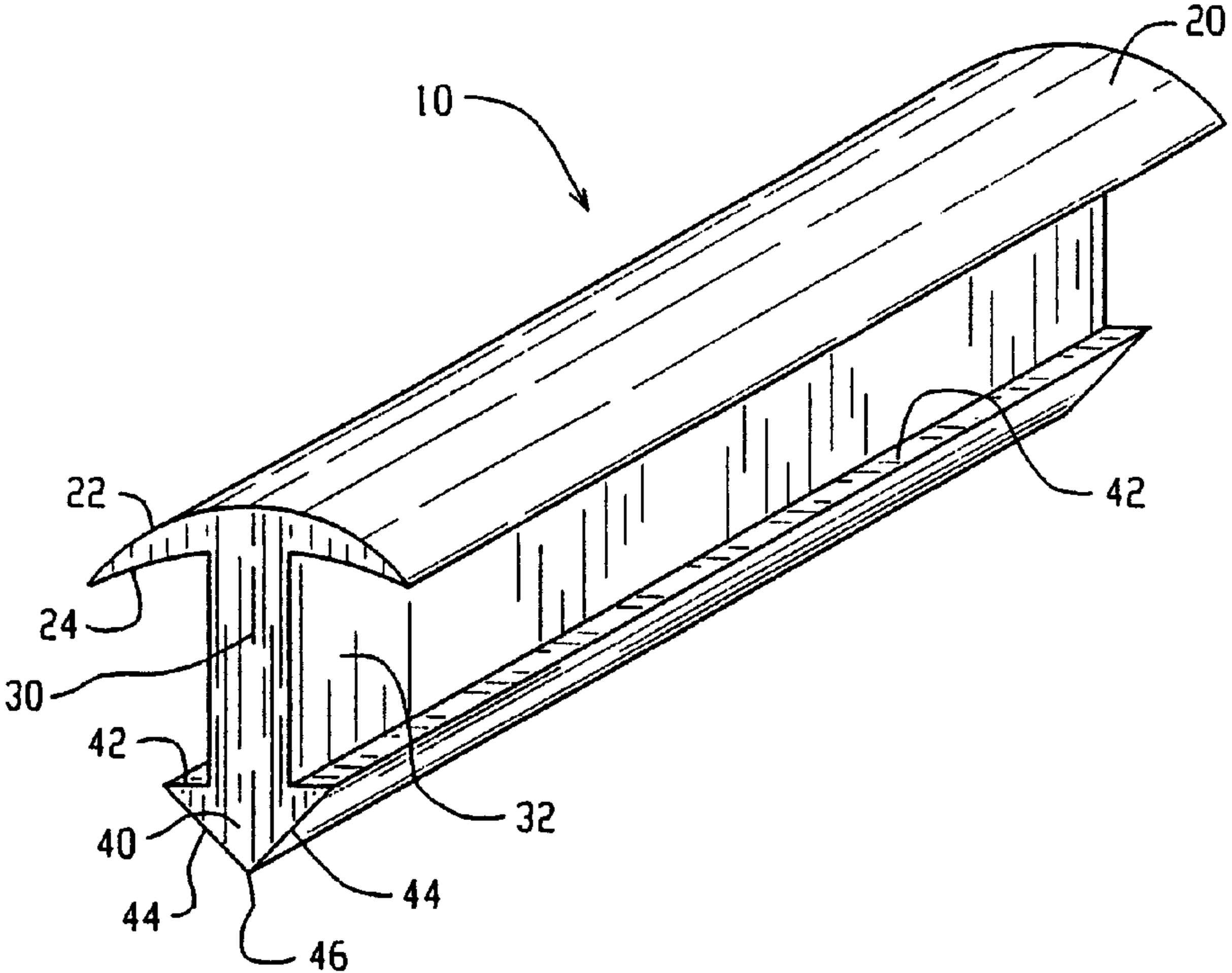
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