Nov. 8, 1966 E. E. HAHN 3,283,674

CONCRETE JOINT INSERT

Filed March 24, 1964

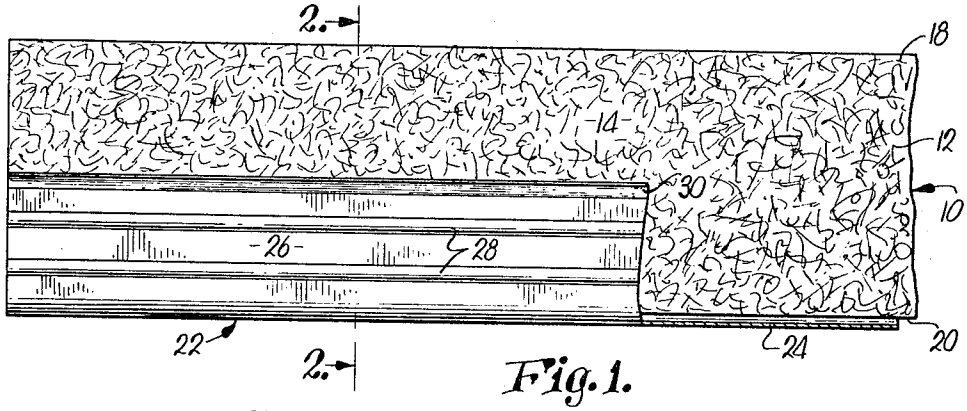


Fig. 1.

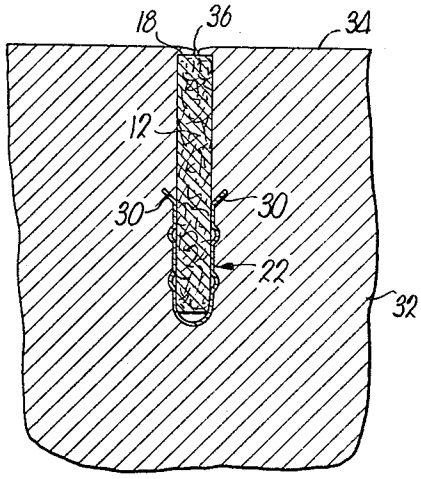


Fig. 3.

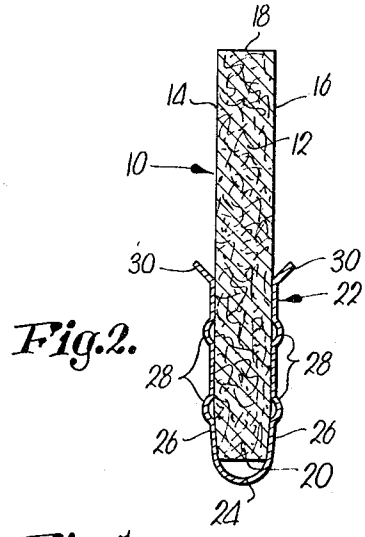


Fig. 2.

Fig. 5.

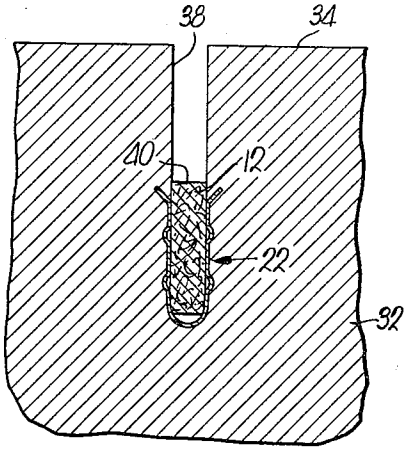
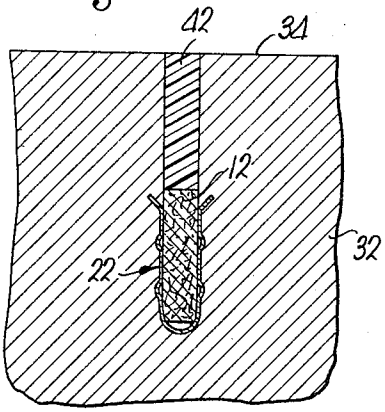


Fig. 4.



INVENTOR.
Emeran E. Hahn

BY

Hovey, Schmidt, Johnson & Hovey.
ATTORNEYS.

United States Patent Office

3,283,674

Patented Nov. 8, 1966

3,283,674

CONCRETE JOINT INSERT

Emeran E. Hahn, Overland Park, Kans., assignor, by mesne assignments, to Clipper Manufacturing Company, Inc., Grandview, Mo., a corporation of Massachusetts

Filed Mar. 24, 1964, Ser. No. 354,262
3 Claims. (Cl. 94—18)

This invention relates to concrete slab construction, and more particularly, to an insert for placement in a mass of green concrete to present a joint therefor so that a groove or kerf may be formed in the concrete after it has set.

In forming concrete slabs, a kerf is cut in a mass of concrete after it has "set" and a joint sealer is deposited in the kerf to fill the latter. It has been found that certain aggregates cannot be cut or sawed when the same are green. To overcome this problem strips of material capable of being sawed have been placed either by hand or by machine into a mass of concrete before it has set to define a joint in the mass so that a blade comprising a part of conventional equipment may be used to form a kerf along the joint defined by the strip even though the concrete is green.

Heretofore, the strip has been formed from a fibrous material impregnated with a bituminous substance to render the strip waterproof, as well as to provide a degree of stiffness therefor. However, when the strip is sawed, the bituminous substance in the strip is caused to coat the side walls of the joint so that a sealant placed in the joint after the kerf is formed, does not adequately adhere to the side walls. Another problem with the use of the aforesaid strips is that the same are quite flexible and, when placed in a mass of concrete, assume an undulated or wavy configuration or is caused to "snake" by virtue of various stresses placed on the sides of the strips along their lengths. As a result, it is difficult to follow the strips during the kerf-forming operations.

Other problems which are presented with the use of the aforesaid strips include the fact that the strips tilt to the side after being inserted in a mass of concrete and the fact that the strips tend to move upwardly due to the buoyancy of the strips in a concrete mass.

The present invention provides an insert which overcomes all of the aforesaid problems of inserts heretofore utilized for the foregoing purpose and is directed to a unit having a relatively rigid base secured to a strip of fibrous material impregnated with a substance presenting dry fragmentations when the strip is sawed. Thus, the strip will not "snake," tilt, float upwardly, or cause the side walls of a mass of concrete to be coated with a substance not compatible with conventional sealants and which are used to fill the kerf.

It is, therefore, the primary object of the present invention to provide an insert for use in kerf-forming operations to overcome the problems hereinabove set forth, especially the problem of coating the side walls of a concrete slab as a kerf is being formed therein, whereby a sealant may be deposited in the kerf and properly bonded to the aforesaid side walls.

Another object of the present invention is the provision of an insert of the type described which includes a relatively rigid clip clamped to a strip of fibrous material impregnated with a suitable substance permitting dry fragmentation of the strip upon being sawed, the clip having a density relatively greater than the density of the strip, whereby the clip will provide a suitable anchor for the strip after the insert is placed in a mass of green concrete to prevent "snaking," tilting, or floating of the strip in a mass of concrete while the latter is setting to a hardened condition.

Another object of this invention is to provide an insert unit which is simple in construction, economical to produce, and capable of being handled without damage thereto prior to and during the insertion of the same in a mass of flowable concrete.

In the drawing:

FIGURE 1 is a fragmentary, side elevational view of the unit made pursuant to the concepts of the present invention and illustrating a fibrous strip clamped by and projecting outwardly from a relatively rigid clip;

FIG. 2 is a cross-sectional view of the insert taken along line 2—2 of FIG. 1;

FIG. 3 is a sectional view of a concrete slab with the insert placed therein and prior to the formation of a kerf in the slab;

FIG. 4 is a view similar to FIG. 3 but illustrating the kerf formed in the slab by removing a portion of the insert; and

FIG. 5 is a view similar to FIGS. 3 and 4 but showing a sealant in the kerf.

An insert for use in kerf-forming operations is broadly denoted by the numeral **10** and includes a strip **12** of fibrous material having a pair of opposed faces **14** and **16**, and a pair of longitudinal edges **18** and **20**. Strip **12** is impregnated with a suitable resin material to waterproof the same and is treated with a material, such as alum or the like, to provide vermin resistance therefor.

Strip **12** is relatively self-sustaining when placed on edge, but is capable of being sawed and thereby reduced in size, either in length or width. The nature of the substances which are impregnated in strip **12** is such as to bind the fibers together and is capable of being sawed in a manner to present dry fragmentations rather than sticky or wet fragmentations. The reason for this characteristic of strip **12** will be set forth hereinafter.

Insert **10** further includes a transversely U-shaped clip **22** having a bight **24**, and a pair of sides **26** integral with bight **24** and extending away therefrom. Clip **22** has a length substantially equal to the length of strip **12** and is preferably formed from a material having spring characteristics, such as roll-formed galvanized steel. The distance between sides **26** is such that when one longitudinal margin of strip **12** is disposed between sides **26** the latter clamp strip **12** therebetween so as to couple strip **12** to clip **22** to form a unitary structure. In this respect, the width of clip **22** is somewhat less than the width of strip **12** so that when edge **20**, for instance, is adjacent bight **24**, edge **18** is spaced a distance from the outermost longitudinal edges of sides **26**.

Each side **26** has a pair of parallel ribs **28** extending longitudinally of clip **22** intermediate the longitudinal edges of the corresponding side **26**. A lateral projection or lip **30** extends outwardly from the outermost longitudinal edge of each side **26**.

In use, insert **10** is "planted" or placed into a mass of concrete before the mass has set, and in this respect, insert **10** is especially suitable for use with green concrete which is quite difficult to saw with conventional kerf-forming equipment; as shown in FIG. 3, insert **10** is disposed in a mass **32** of concrete with edge **18** of strip **12** adjacent to but slightly below the upper surface **34** of mass **32**. Clip **22** is thus embedded in mass **32** a distance below surface **34** in a manner such that lips **30** and ribs **28** project into mass **32**. The placement of insert **10** is facilitated by virtue of the fact that bight **24** serves as a leading edge for insert **10** as the latter is "planted" in mass **32**. After insert **10** has been properly positioned in mass **32**, ribs **28** and **30** prevent tilting and upward floating of insert **10** in mass **32** so that insert **10** is retained in a fixed position. The rigid nature of clip **22** permits ready placement of insert **10** without damag-

ing the same even though strip **12** may be easily broken in half.

Insert **10** may be flush with surface **34** of mass **32** but even if it is below surface **34**, it can be easily located after mass **32** is set by virtue of the fact that a narrow crack **36** will be formed in surface **34**. During cool weather crack **36** is not formed as quickly as in warm weather. Nonetheless, crack **36** will be formed and will outline the position of insert **10** in mass **32**.

After mass **32** has set, a kerf **38** is formed therein by conventional equpiment passing over surface **34** and removing the upper portion of strip **12** to present an edge or face **40** on the remaining portion of strip **12** spaced a distance below surface **34** as shown in FIG. 4. As mentioned above, the substances impregnating strip **12** are such as to present dry fragmentations when strip **12** is sawed. The fragmentations are thrown out of the groove or kerf **38** formed in mass **32** by the blade forming the kerf. Thus, the side walls defining kerf **38** are clean inasmuch as none of the fibrous material forming strip **12** or the substances impregnating strip **12** adhere to the side walls. Thus, when a quantity of sealant **42** is deposited in kerf **38** as shown in FIG. 5, sealant **42** will properly adhere to the side walls of the kerf to seal the joint between the slabs of concrete on opposed sides of the kerf.

The width of kerf **38** is preferably at least as great as the thickness of strip **12** so that the upper portion of the latter will be completely removed during the kerf-forming operation. The width of kerf **38** depends upon governmental regulations so that the thickness of strip **12** may be made accordingly. Also, the depth of kerf **38** is governed by the aforesaid regulations and the width of strip **12** is thus made accordingly. The width of strip **12** is such that the blade forming kerf **38** does not contact clip **22**. Although it is preferable to have clip **22** of a metallic material to provide a low center of gravity for insert **10**, it is clear that clip **22** may be formed of any other suitable spring-like material, such as plastic or the like.

By using rigid clip **22**, insert **10** may be made in relatively long lengths which are not easily broken into small pieces during handling thereof. Also, clip **22** prevents "snaking" of insert **10** before or after insert **10** has been placed in a mass of concrete. Clip **22** also provides a rigid leading edge so that insert **10** may be easily pressed down into the green concrete. Clip **22** serves to lower the center of gravity of insert **10** so that the latter will remain in an upright position when placed in the concrete. This prevents strip **12** from tilting and thus eliminates a concrete overhang after the kerf is formed, which overhang easily breaks off quite easily under heavy loads of cars and trucks. Furthermore, when the strip is cut while in a tilted position, the strip is not adequately removed from the kerf. As a result, the sealant will not properly adhere to the side walls of the concrete slabs.

Lips **30** and ribs **28** cooperate to prevent the upward floating of insert **10**. Furthermore, ribs **28** provide added stiffness for clip **22** to cause it to resist bending along its length.

Sides **26** frictionally engage faces **14** and **16** of strip **12** adjacent edge **20** thereof so that no additional securing means is required to interconnect strip **12** and clip **22**. Sides **26** may be easily shifted away from each other to permit the insertion of strip **12** therebetween. Upon release of sides **26** the same move into frictional engagement with faces **14** and **16** to clamp strip **12**.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a concrete joint, an insert for placement into green concrete, said insert comprising:

an elongated, relatively flexible strip of fragmentatious, fibrous material including an impregnation binding the fibers together for dry fragmentation when sawed, said strip having a pair of spaced, upright side surfaces; and a relatively rigid, transversely U-shaped clip extending the length of said strip and including a lowermost arcuate bight section and a pair of opposed, upwardly extending legs integral with the bight section, said strip being frictionally clamped between said legs with each leg in engagement with a corresponding surface of said strip and the clip looped over the lowermost marginal edge of said strip, each leg terminating below the upper edge of said strip in lips extending upwardly and outwardly at an angle from the corresponding surface of the strip, said clip being provided with longitudinal extending rib means coextensive with the length of the clip to prevent bending of said insert.

2. An insert as set forth in claim **1** wherein is provided a pair of parallel, outwardly projecting ribs on each leg of said clip.

3. An insert as set forth in claim **2**, said clip having a density greater than the density of said strip.

References Cited by the Examiner

UNITED STATES PATENTS

1,667,313	4/1928	Galassi	94—18
2,540,251	2/1951	Fischer	94—18
3,052,945	9/1962	Cummings	94—51 X

FOREIGN PATENTS

1,151,491	8/1957	France.

CHARLES E. O'CONNELL, *Primary Examiner.*

JACOB L. NACKENOFF, *Examiner.*

N. C. BYERS, *Assistant Examiner.*