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THROUGH-WALL FLASHING STRUCTURES HAVING A SPECIFIC GROOVE ARRANGEMENT

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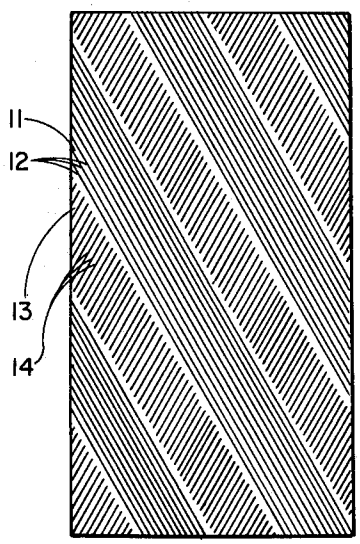


FIG. 1

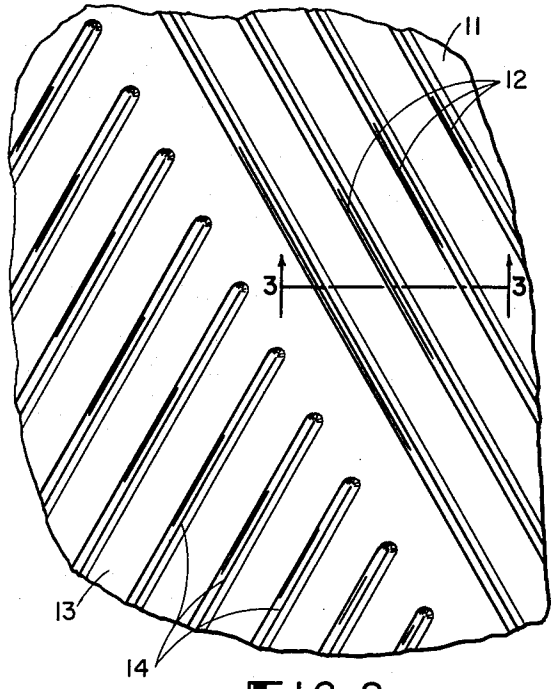


FIG. 2

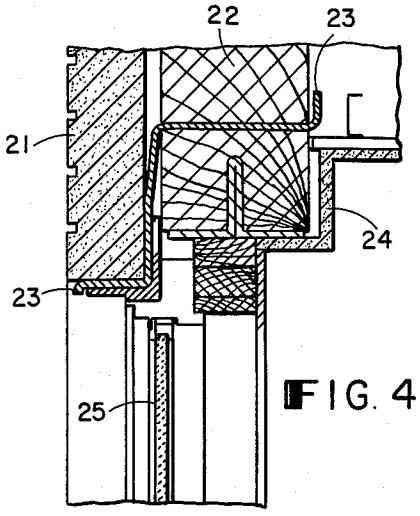


FIG. 4

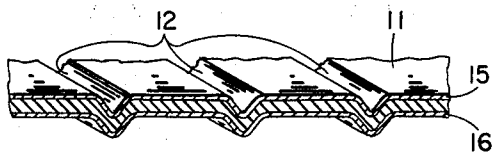


FIG. 3

INVENTOR.
HARRY CHOMES

BY Joseph Feller

ATTORNEY.

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THROUGH-WALL FLASHING STRUCTURES HAVING A SPECIFIC GROOVE ARRANGEMENT

Harry Chomes, 29 Jameson Road, Newton 58, Mass.

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This invention relates to improved through-wall flashing structures and to a novel material from which such flashing can be formed.

Through-wall flashing comprises generally flexible corrosion-resistant sheets which are formed into structures of appropriate shapes and sizes and built into exterior walls, foundations and window structures for water-proofing and damp-proofing purposes. Such flashing acts as a barrier and drainage course for water seepage and is used for water-proofing such portions of a building as, for example, spandrels, window heads and window sills, parapets and tops of foundations. Modern masonry walls, which are usually thin curtain walls, in particular require such water-proofing since driving rain, shrinkage of materials and building movement can cause leaks through mortar joints. The through-wall flashing is embedded in the wall to prevent rain water or moisture that may leak into the exterior wall from coming in contact with steel or wood members in the wall and seeping into the inside of the building.

Various through-wall flashing materials are currently in use. These include, for example, copper sheet and thin copper foil laminated or backed with a bituminous-impregnated web. The copper sheet as sold commercially is usually corrugated or ridged in a parallel form to provide strength, aid in bonding to the mortar and avoid the cracking caused by expansion and contraction.

However, previously described flashing materials have one or more disadvantages which tend to limit their use in building construction. Thus, for example, pure copper is quite expensive while the less expensive thin copper-clad backings or reinforced asphalt are not as durable. Thick copper sheets are difficult for the roofer to form while thin copper sheets tend to crack more easily. Other metals or alloys which are resistant to water are affected by the alkaline exudate of mortar.

Further, regardless of the nature of the material used, previously described flashing materials, when formed into flashing structures in a building, often tend to accumulate internal pools of moisture which do not drain and hence cause perforations or separations of the flashing structure.

One object of this invention is to provide an inexpensive, durable, flexible flashing material which can be readily used by the builder for through-wall flashing.

A further object of this invention is to provide such flashing which has an effective mortar bond under all installation conditions and will resist the forces of expansion and contraction.

Yet another object of this invention is to provide such flashing which will have improved effectiveness in conducting moisture to the outside.

Other objects and advantages of this invention will be apparent from the specification and claim which will follow and from the appended drawings illustrating a preferred embodiment of this invention wherein:

FIGURE 1 is a top view of a strip of flashing material made in accordance with this invention.

FIG. 2 is an enlargement of a portion of FIG. 1.

FIG. 3 is a section 3—3 of a portion of FIG. 2.

FIG. 4 is a vertical section of a flashing structure made from the strip of this invention and installed in a window head.

This invention comprises generally a rectangular strip

of flexible water-resistant material having spaced, non-intersecting grooves on its top surface and corresponding ridges on its bottom surface. The grooves are arranged in two sets of parallel bands, all of uniform width. Each band of one set alternates with and is adjacent to a band of the second set. Each band has a uniform array of grooves extending the length of the band. All bands have uniform longitudinal margins which are flat on both surfaces. The spacing between adjacent grooves is uniform in all bands. All the grooves in one set of bands are disposed at a first identical angle of less than 90° with respect to the width of the strip. All the grooves in the second set are at a second identical angle which is the supplement of the first angle. It is generally preferred that the first angle be between 15 and 75°.

The flashing structure is made by cutting the strip transversely and longitudinally to form a piece of appropriate size and shape and then bending the piece into the desired form for insertion into the building structure.

In particular, it has been found most effective to have the bands make an angle of approximately 60° with the width of the strip and have the groove angle of one set of bands be 60° with the width of the strip, the groove angles of the other set of bands forming an angle of 120° with the width of the strip, giving the general appearance of equilateral triangles.

As regards the material from which the strip is made it can be any durable water-resistant material of sufficient flexibility for bending into the shape of a flashing structure. However, it is generally preferred that it be a metal as, for example, copper, zinc, alloy, aluminum, galvanized iron, etc. Copper is generally regarded as the most durable of water-resistant flexible metals but it is an important feature of this invention that copper need not be used. Thus, both surfaces of the metal can be coated with a resistant coating which will withstand the action of the common exudates in masonry structures such as bases. Among the resistant coating bases that can be used are thermo-plastic polymers such as epoxy resins, acrylic resins and vinyl copolymers. Where metals other than copper are used it is important that such resistant coating be employed.

Referring now to the drawings, FIG. 1 illustrates the top surface of a rectangular strip of approximately 2 feet wide and 4 feet long made in accordance with this invention. The scale is 1"—one foot. The surface comprises parallel adjacent alternating uniform-width bands each forming an angle of 60° with the width of the strip. The bands 11 alternate with the bands 13. The grooves 12 in the bands 11 are parallel to each other and to the long dimension of the bands and extend the length of the band. The grooves 14 in the bands 13 are parallel to each other but are at a 60° angle with the long dimension of the bands, and 120° with the width of the strip. The longitudinal margins of the bands are flat on both surfaces and are of uniform width.

As illustrated in FIGURE 3, the strip, which in this case is an essentially non-cuprous water-resistant metal, such as galvanized iron, zinc alloy or aluminum, is coated with a liquid-resistant coating 15 on the top surface and 16 on the bottom surface.

A portion 23 of the strip is cut and bent to form a flashing structure as illustrated in FIGURE 4. The flashing is set into the window head structure with its brick exterior wall 21, interior wooden framing 22, interior wall 24 and window 25. Any moisture that comes down onto the flashing from any direction is conducted to the outside with the aid of the angularly-disposed grooves.

Because of the groove and ridge construction of this invention not only is drainage superior, but bonding of the flashing to the mortar is markedly improved. Further, relatively inexpensive water-resistant flexible metals

such as zinc, zinc alloy, aluminum and galvanized iron can be used in this invention to yield a durable product.

I claim:

1. A rectangular strip of flexible water-resistant metal having spaced, non-intersecting grooves on its top surface and corresponding ridges on its bottom surface; the grooves being arranged as arrays in two sets of parallel bands; each band of one set alternating with and being adjacent to a band of the second set; the array of grooves in any band extending the length of the band; the spacing between adjacent grooves being uniform in all bands; all bands being of uniform width and having uniform logitudinal margins which are flat on both surfaces; all the grooves in one set being at a first identical angle of less than 90° with respect to the width of the strip; all the grooves in the second set being at a second identical angle which is the supplement to said first angle.

2. A rectangular strip of flexible water-resistant material having spaced, non-intersecting grooves on its top surface and corresponding ridges on its bottom surface; the grooves being arranged as arrays in two sets of parallel bands; a band of one set alternating with and being adjacent to a band of the second set; the array of grooves in any band extending the length of the band; the spacing between adjacent grooves being uniform in all bands; all bands being of uniform width and having uniform longitudinal margins which are flat on both surfaces; all the grooves in one set being at a first identical angle of less than 90° with respect to the width of the strip; all the grooves in the second set being at a second identical angle which is the supplement to said first angle; said strip comprising metal coated on both surfaces with a base-resistant coating.

3. A rectangular strip of flexible water-resistant material having spaced, non-intersecting grooves on its top surface and corresponding ridges on its bottom surface; the grooves being arranged as arrays in two sets of parallel bands; a band of one set alternating with and being adjacent to a band of the second set; the array of grooves in any band extending the length of the band; the spacing between adjacent grooves being uniform in all bands; all bands being of uniform width and having uniform longitudinal margins which are flat on both surfaces; all the grooves in one set being at a first identical angle of less than 90° with respect to the width of the strip; all the grooves in the second set being at a second identical angle which is the supplement to said first angle; said strip comprising metal coated on both surfaces with a coating having as its base a resin selected from the group consisting of epoxy, acrylic and vinyl resins.

4. A flashing structure formed from a rectangular strip of flexible water-resistant metal having spaced, non-intersecting grooves on its top surface and corresponding ridges on its bottom surface; the grooves being arranged as arrays in two sets of parallel bands; a band of one set alternating with and being adjacent to a band of the second set; the array of grooves in any band extending the length of the band; the spacing between adjacent grooves being uniform in all bands; all bands being of uniform width and having uniform longitudinal margins which are flat on both surfaces; all the grooves in one set being at a first identical angle of less than 90° with respect to the width of the strip; all the grooves in the second set being at a second identical angle which is the supplement to said first angle.

5. A flashing structure formed from a rectangular strip of flexible water-resistant material having spaced, non-intersecting grooves on its top surface and corresponding ridges on its bottom surface; the grooves being arranged as arrays in two sets of parallel bands; a band of one set alternating with and being adjacent to a band of the second set; the array of grooves in any band extending the length of the band; the spacing between adjacent grooves being uniform in all bands; all bands being of uniform width and having uniform longitudinal margins which are flat on both surfaces; all the grooves in one set being at a first identical angle of less than 90° with respect to the width of the strip; all the grooves in the second set being at a second identical angle which is the supplement to said first angle, said strip comprising metal coated on both surfaces with a base-resistant coating.

6. A flashing structure formed from a rectangular strip of flexible water-resistant material having spaced, non-intersecting grooves on its top surface and corresponding ridges on its bottom surface; the grooves being arranged as arrays in two sets of parallel bands; a band of one set alternating with and being adjacent to a band of the second set; the array of grooves in any band extending the length of the band; the spacing between adjacent grooves being uniform in all bands; all bands being of uniform width and having uniform longitudinal margins which are flat on both surfaces; all the grooves in one set being at a first identical angle of less than 90° with respect to the width of the strip; all the grooves in the second set being at a second identical angle which is the supplement to said first angle; said strip comprising metal coated on both surfaces with a coating having as its base a resin selected from the group consisting of epoxy, acrylic and vinyl resins.

7. A rectangular strip of flexible water-resistant metal having spaced non-intersecting grooves on its top surface and corresponding ridges on its bottom surface; the grooves being arranged as arrays in two sets of parallel bands; each band of one set alternating with and being adjacent to a band of the second set; the array of grooves in any band extending the length of the band; the spacing between adjacent grooves being uniform in all bands; the bands forming an angle of about 60° with the width of the strip; all bands being of uniform width and having longitudinal margins which are flat on both surfaces; all the grooves in one set being at an angle of about 60° with respect to the width of the strip; all the grooves in the other set being at an angle of about 120° with respect to the width of the strip.

8. A rectangular strip of flexible water-resistant material having spaced non-intersecting grooves on its top surface and corresponding ridges on its bottom surface; the grooves being arranged as arrays in two sets of parallel bands; each band of one set alternating with and being adjacent to a band of the second set; the array of grooves in any band extending the length of the band; the spacing between adjacent grooves being uniform in all bands; the bands forming an angle of about 60° with the width of the strip; all bands being of uniform width and having longitudinal margins which are flat on both surfaces; all the grooves in one set being at an angle of about 60° with respect to the width of the strip; all the grooves in the other set being at an angle of about 120° with respect to the width of the strip; said strip comprising metal coated on both surfaces with a base-resistant coating.

9. A flashing structure formed from a rectangular strip of flexible water-resistant metal having spaced non-intersecting grooves on its top surface and corresponding ridges on its bottom surface; the grooves being arranged as arrays in two sets of parallel bands; each band of one set alternating with and being adjacent to a band of the second set; the array of grooves in any band extending the length of the band; the spacing between adjacent grooves being uniform in all bands; the bands forming an angle of about 60° with the width of the strip; all bands being of uniform width and having longitudinal margins which are flat on both surfaces; all the grooves in one set being at an angle of about 60° with respect to the width of the strip; all the grooves in the other set being at an angle of about 120° with respect to the width of the strip.

10. A flashing structure formed from a rectangular strip of flexible water-resistant material having spaced non-intersecting grooves on its top surface and corresponding ridges on its bottom surface; the grooves being arranged as arrays in two sets of parallel bands; each band of one set alternating with and being adjacent to a band of the second set; the array of grooves in any

band extending the length of the band; the spacing between adjacent grooves being uniform in all bands; the bands forming an angle of about 60° with the width of the strip; all bands being of uniform width and having longitudinal margins which are flat on both surfaces; all the grooves in one set being at an angle of about 60° with respect to the width of the strip; all the grooves in the other set being at an angle of about 120° with respect to the width of the strip; said strip comprising metal coated on both surfaces with a base-resistant coating.

11. A rectangular strip of durable, water-resistant material of sufficient flexibility for bending into the shape of a flashing structure; said strip having spaced, non-intersecting grooves on its top surface and corresponding ridges on its bottom surface; the grooves being arranged as arrays in two sets of parallel bands; each band of one set alternating with and being adjacent to a band of the

second set; the array of grooves in any band extending the length of the band; the spacing between adjacent grooves being uniform in all bands; all bands being of uniform width and having uniform longitudinal margins which are flat on both surfaces; all the grooves in one set being at a first identical angle of less than ninety degrees (90°) with respect to the width of the strip; all the grooves in the second set being at a second identical angle which is the supplement to said first angle.

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