United States Patent

Butterfield

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[54] **ANTISLIP SAFETY SURFACE**

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[52] **U.S. Cl.** **52/177**

[51] **Int. Cl.** **E04f 11/16**

[58] **Field of Search** 52/180, 674, 633, 177; 29/193.5; D13/7–8; D54/2.2

[56] **References Cited**

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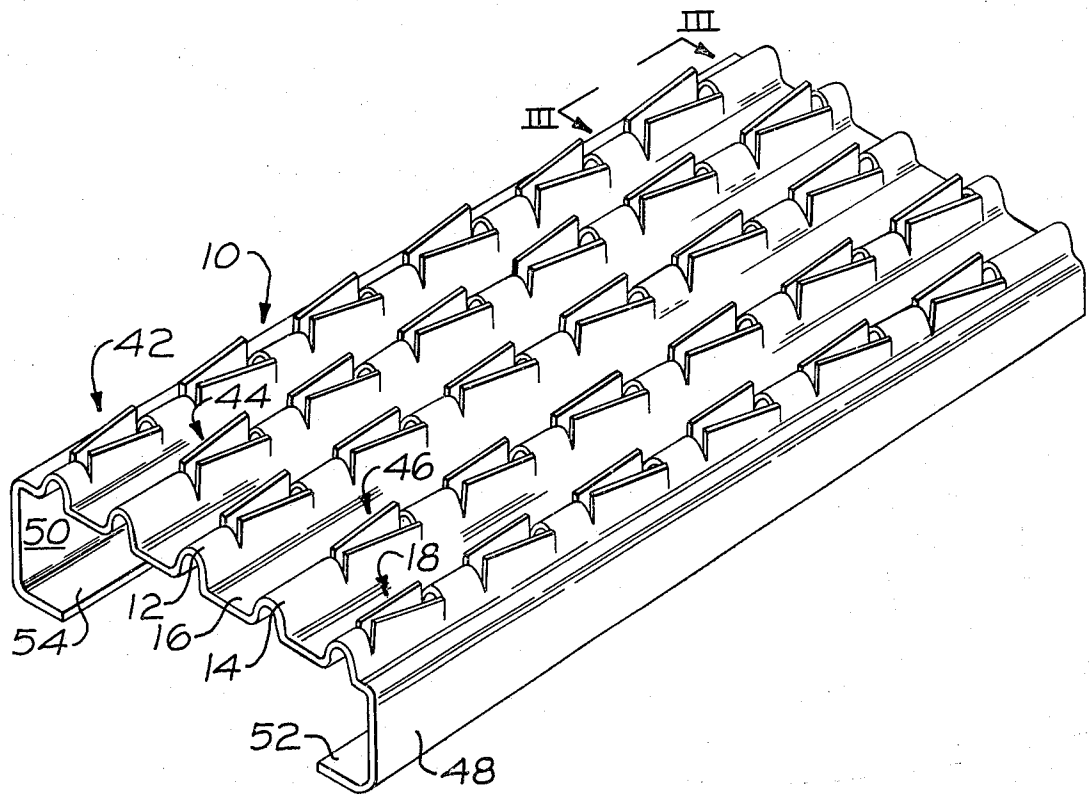
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[57] **ABSTRACT**

An antislip safety surface consisting of a plate member having a plurality of parallel, spaced corrugations or ridges formed therein, and a plurality of overlapping, spaced rows of apertures formed in said ridges by bending upward the ridge material on either side of a diagonal center cut to produce vertical projections having oppositely sloping edges providing a maximum multidirectional holding effect. In an alternate embodiment, adjacent nonoverlapping rows of apertures have located therebetween a plurality of transverse drain apertures.

8 Claims, 3 Drawing Figures



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Fig-1-

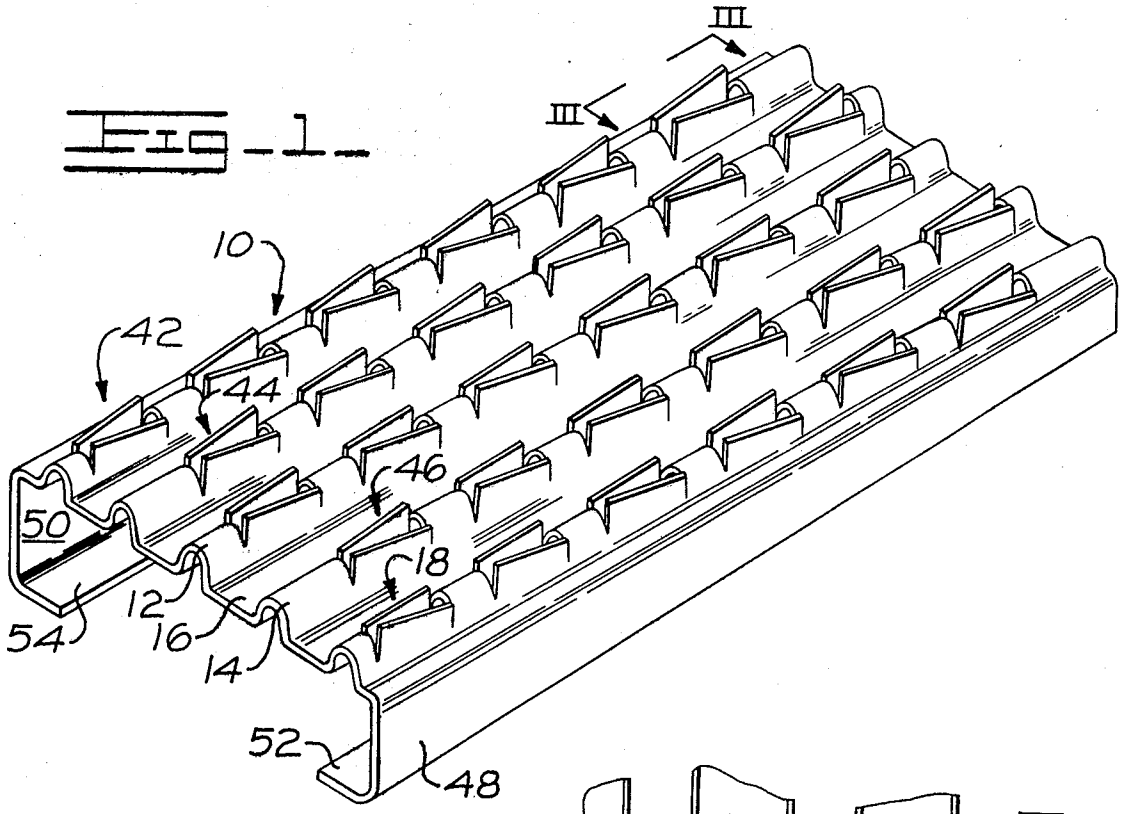
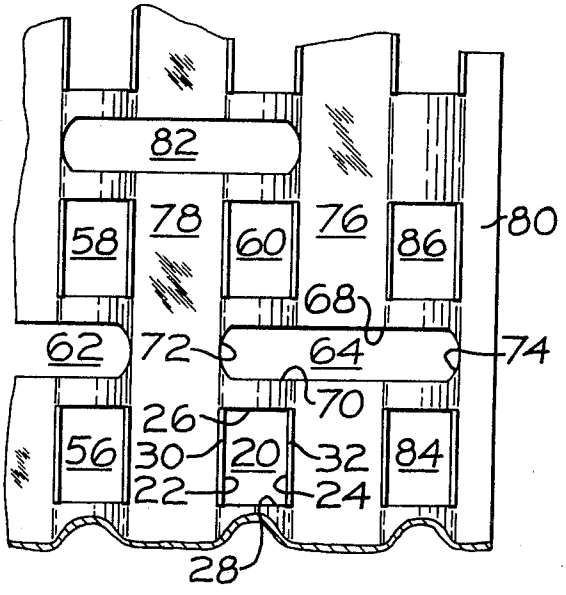


Fig-2-



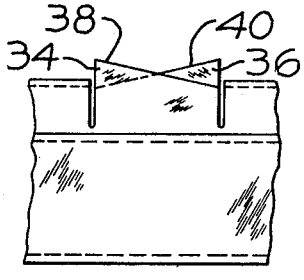


Fig-3-

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ANTISLIP SAFETY SURFACE

BACKGROUND OF THE INVENTION

This invention relates to an antislip safety surface suitable for use in environments wherein slips and falls are likely to occur unless otherwise prevented, e.g., on vehicle and machine operator platforms, steps, etc.

More particularly, this invention is directed to an improved antislip safety surface in the form of a corrugated plate having a series of apertures and projections thereon. The antislip surface of this invention is designed to be an improvement over floor and step surfaces currently widely used in industry. One such surface consists of a flat, imperforate plate having integral, spaced projections thereon. This type of surface has not proved to be entirely satisfactory since accidents continue to occur with this surface due to the fact that fluids such as oil, water, and even mud tend to accumulate and thus produce a slippery, accident-producing surface due to the fact that such fluids cannot drain away.

While other more effective antislip surfaces such as fabricated gratings and reticulated, expanded sheet metal are available which do permit draining off of the unwanted, slippery fluids, they have not proven entirely satisfactory from either a cost or performance standpoint.

It is therefore an object of this invention to provide an improved antislip safety surface having a plurality of apertures to enable draining of fluids from the surface thereof.

It is another object of this invention to provide an improved antislip safety surface having a plurality of projections or flanges having multidirectional holding capability which are formed by displacing upward the material removed to produce the drain apertures.

It is still another object of this invention to provide an improved antislip safety surface having a plurality of spaced corrugations for purposes of strength and rigidity.

Further and more specific objects and advantages of the present invention and of the manner in which it is carried into practice are made apparent in the following specification wherein the invention is described in detail by reference to the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is an isometric view of the antislip safety surface of this invention formed into an elongated strut.

FIG. 2 is a top view of an alternate embodiment of this invention illustrating the spacing and location of the projections and drain apertures.

FIG. 3 is a view taken in direction III—III in FIG. 1 illustrating a pair of projections in detail.

DETAILED DESCRIPTION

Referring to FIG. 1, there is shown generally at **10** a strut member application of the antislip safety surface of this invention. The antislip safety surface is formed from an integral, flat plate or sheet of rigid material such as metal by first producing a parallel plurality of spaced, longitudinal corrugations therein. Typical corrugations **12**, **14** are in the form of vertically oriented, arcuate ridges or columns separated by a typical, undisturbed valley portion **16** in the plane of the plate.

Rows of apertures are then formed by perforating the ridges at spaced intervals. Each aperture, as for example aperture **18**, is formed by making a pair of spaced, lateral cuts and a generally longitudinal, diagonally oriented cut across the ridge apex, the diagonally oriented cut being bounded by the pair of lateral cuts. By bending up the ridge portions thus freed there are produced a pair of longitudinally oriented and laterally spaced vertical projections or flanges bordering the lateral sides of the generally rectangular aperture thus produced.

As best seen in FIG. 2, a given aperture **20** is defined by a pair of longitudinally oriented lateral edges **22**, **24** and a pair of laterally oriented longitudinal edges **26**, **28**. Each of the vertical projections or flanges **30**, **32** thus produced defines an attached length edge over the entire length of lateral edges **22**, **24**. The aperture thus defined facilitates draining of slip producing fluids from the antislip safety surface.

In addition, as best seen in FIG. **3**, the aforementioned diagonal cut produces the desirable feature of the free length edge of each flange of each pair of flanges having a slope with respect to the plane of the plate which is equal and opposite to that of its corresponding flange in the pair. Thus a superior antislip surface having a maximum multidirectional holding effect is produced. For example, flanges **34**, **36** have opposite sloping edges **38**, **40**, respectively which provide the desired effect.

Referring again to FIG. **1**, it is noted that succeeding rows of apertures and their corresponding projections are formed in mutually exclusive alternate ridges in parallel, overlapping rows. For example, the row defined by apertures **18** and **42** is overlapped by the row defined by apertures **44** and **46** in order to produce an enhanced distribution of projections over the antislip safety surface.

Vertically downwardly oriented support flanges **48**, **50** having laterally inward mounting flanges **52**, **54**, respectively are additionally formed along each longitudinal plate edge for mounting purposes. However, in many applications these flanges would not be needed inasmuch as the antislip safety surface can be alternatively mounted in its flat, planar condition.

Referring now to FIG. **2** there is shown an alternative embodiment of the invention wherein successive rows of apertures are located on each ridge in a nonoverlapping manner in order that additional transverse drain apertures may be formed between the rows for improved drainage. For example, rows defined by apertures **20**, **56** and **58**, **60** have additional transverse drain apertures **62**, **64** in a row therebetween. A typical transverse drain aperture **64** is equally spaced from its adjacent rows of apertures and has a pair of parallel, lateral length edges **68**, **70** and a pair of longitudinal width edges **72**, **74**. While the length of the transverse drain aperture is shown to extend across two adjacent ridges, such length may be shortened to encompass only the valley portion **76** and still function to drain any fluid which may have collected in the valley portion. The transverse drain apertures in a given row are located in alternate valleys. The primary advantage of having the length as shown in the figure is that adjacent valleys **78**, **80** may be additionally drained.

Succeeding rows of apertures are alternated in order to facilitate draining. Thus, transverse drain aperture **64** encompasses the column defined by apertures **84**, **86**, and transverse drain aperture **82** encompasses the column defined by apertures **56**, **58**. Transverse apertures **64**, **82** overlap to both encompass the column defined by apertures **20**, **60**.

It is to be understood that the foregoing description is merely illustrative of preferred embodiments of the invention and that the scope of the invention is not to be limited thereto, but is to be defined by the scope of the appended claims.

What is claimed is:

1. An integral antislip safety surface comprising a plate of rigid material having a plurality of spaced, longitudinally oriented corrugations therein defining generally arcuate, vertical ridges, set off by valley portions, a plurality of laterally oriented rows of apertures in said ridges, each of said apertures defining a pair of longitudinally oriented edges and a pair of laterally oriented edges, each aperture having a pair of flanges formed by displacing corrugation material upward when the apertures are formed, said flanges being elongated plate members having an attached length edge secured to each of the longitudinal edges of each of said apertures, said flanges extending vertically upward from the plane of said plate, each flange also having an unattached length edge having a slope with respect to the plane of said plate member, wherein the slope of the unattached length edge of each flange of each pair of flanges is equal and opposite to that of its corresponding flange in the pair.

2. The antislip safety surface of claim **1** wherein successive rows of apertures are located on each ridge in a nonover-

lapping manner, and wherein a plurality of transverse drain apertures are located between the rows.

3. The antislip safety surface of claim 2 wherein said transverse drain apertures define rows between said apertures and wherein each transverse drain aperture is located in alternate valleys in a given row.

4. The antislip safety surface of claim 3 wherein each transverse drain aperture has a pair of parallel, lateral length edges and a pair of longitudinal width edges.

5. The antislip safety surface of claim 4 wherein each pair of lateral length edges is of a length to extend across two adjacent ridges.

6. The antislip safety surface of claim 1 wherein successive rows of apertures are formed in mutually exclusive alternate ridges in successive, overlapping rows.

7. The antislip safety surface of claim 6 wherein the plate defines a pair of longitudinal plate edges and vertically downwardly oriented support flanges extend therefrom.

8. The antislip safety surface of claim 7 wherein said support flanges each have laterally inwardly oriented mounting flanges attached thereto.

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