

[54] **GRIDS, GRATINGS OR LIKE OPEN WORK
SUPPORT SURFACES OR FLOORS**

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[52] **U.S. Cl.**..... **52/180, 94/5**

[51] **Int. Cl.**..... **E04c 2/42**

[58] **Field of Search**.....32/177-182, 664, 666,
32/667, 668, 669; 94/5

[56] **References Cited**

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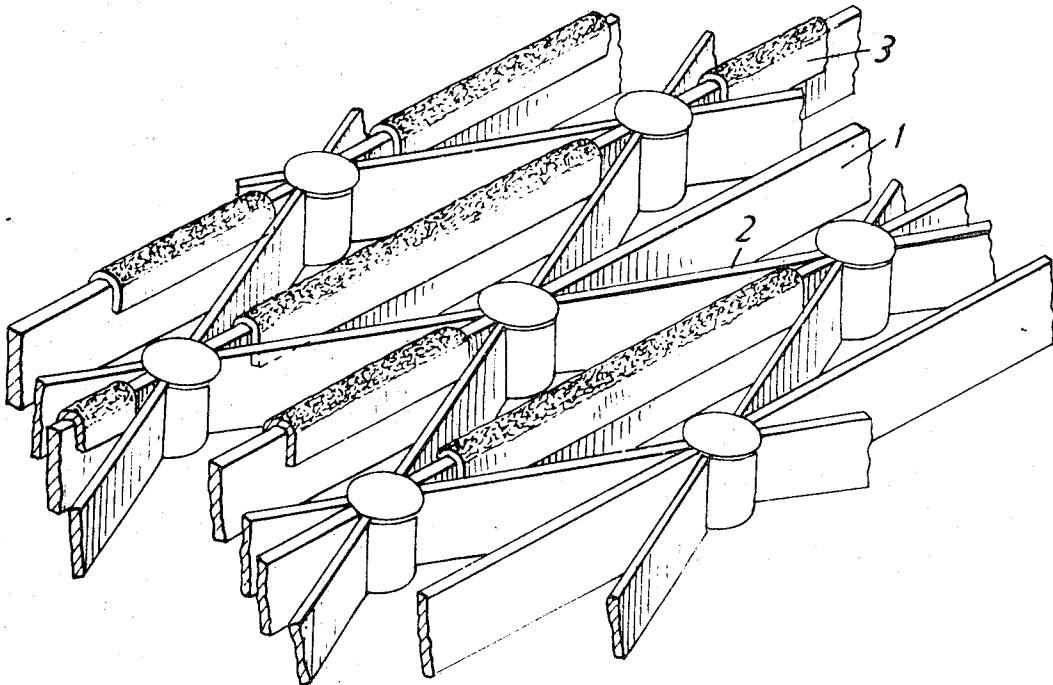
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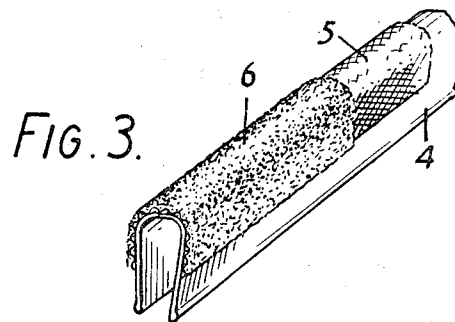
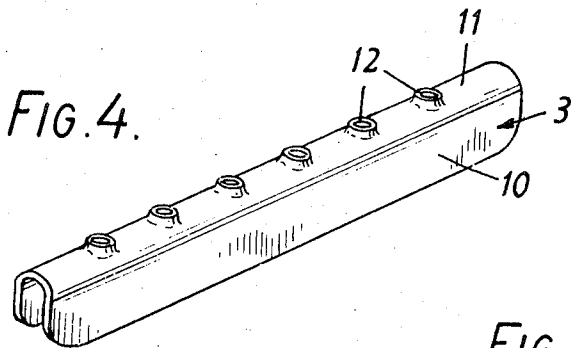
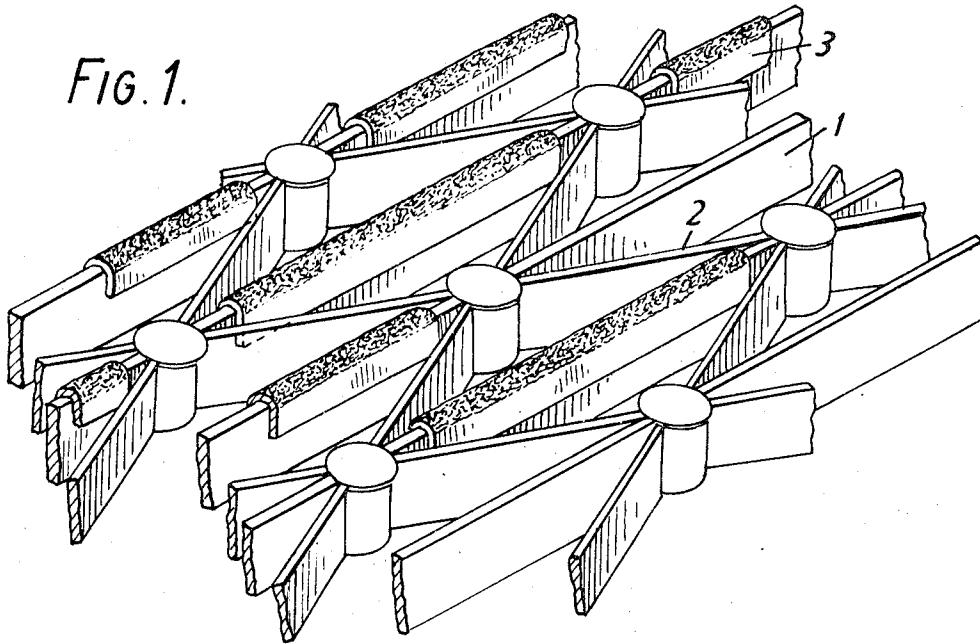
[57] **ABSTRACT**

The invention relates to improvements in or relating to grids, gratings or the like open work support surfaces or floors and has particular application to providing a non-slip or slip-resistant surface.

The invention provides a slip-resistant member for attachment to a grating having load bearing means, where the slip-resistant member is constructed to permit attachment to or removal from the load bearing means of the grating.

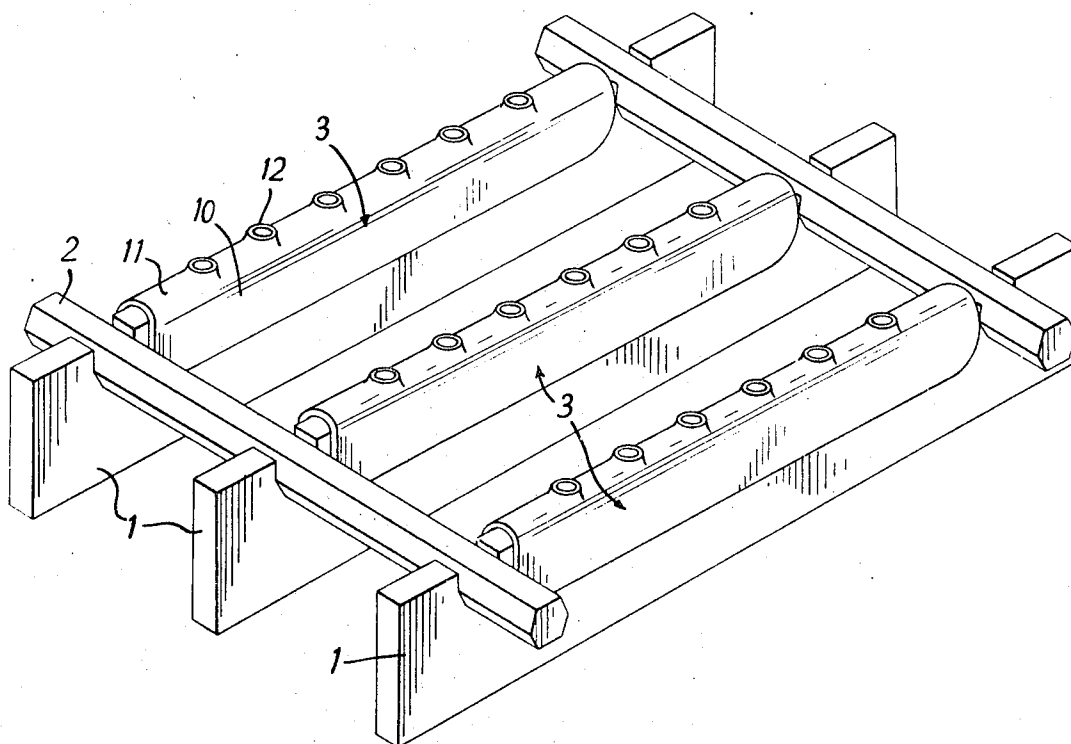
1 Claim, 4 Drawing Figures





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FIG. 2



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GRIDS, GRATINGS OR LIKE OPEN WORK SUPPORT SURFACES OR FLOORS

The present invention relates to improvements in or relating to grids, gratings or like open-work support surfaces or floors, and has particular application to providing a non-slip or slip-resistant surface. As used herein, the term grating is to be understood to include grids, gratings or like open-work support surfaces and floors, and to include gratings having square, rectangular or diamond mesh patterns.

In gratings such as that provided for industrial uses, the surface may become dangerous and slippery due to the presence of oil, grease, chemicals or ponders in such plants as oil refineries, chemical plants, power station, oil drilling rigs and the like. Where gratings are provided in the open, rain or ice can collect on the bars thus making the walking surface extremely dangerous.

The provision of a non-slip or slip-resistant surface for a grating may be applied directly to or form an integral part of the grating but this is expensive and difficult to replace when worn.

It is among the objects of the present invention to provide an economical and easy method of providing a non-slip or slip-resistant surface for gratings.

According to one feature of the present invention there is provided a non-slip or slip-resistant member for attachment to a grating having a load or bearing surface, so constructed as to permit attachment to or removal from the load bearing or supporting members of the grating.

The member is preferably in the form of an inverted U-shaped clip of such dimensions and shape that it will fit over the top edge of a load bearing bar of a grating with the side arms of the clip extending to grip firmly the sides of the bar with the spine of the clip resting on the narrow edge or load bearing surface of the bar. It is not essential for all the surface to be treated to provide the non-slip or slip-resistant surface since it is the spine which provides the said surface so that when a number of clips are arranged in position over an area of grating a definite non-skid characteristic is imparted to the surface.

The clips may be of such lengths as to fit snugly between lateral members of the open work of the grating or to fit along lengths of bars between intersections provided in the grating. The clip may be of metal or of synthetic plastics material.

When the member is formed from metal, this is for example of spring steel, to which the spring characteristics may be imparted by heat treatment after the member has been formed into the shape of a clip. The spine of the clip may be provided, by piercing or similar operation, with a series of projections or raised members one form of which can be hollow truncated cones.

In an alternative construction the spine of the clip and part of the sides are coated with an adhesive material, such as an epoxy resin; and abrasive grit, such as aluminous oxide or silicon carbide, is pressed into the adhesive and the whole allowed to cure. Such a construction is expensive but provides an even walking surface and a surface which repels oil and water. The latter is particularly advantageous since this prevents icing in winter.

Where the clip is of a synthetic plastics material, this is preferably of high density polyvinyl chloride or polypropylene, and by passing the synthetic plastics mate-

rial through a suitable die the clip is formed. Thermo-setting synthetic plastics materials may be used, such as epoxy resin or polyester resin, which may be suitably reinforced with fibreglass or carbon filaments.

Alternatively the member may comprise a layer of synthetic plastics material, preferably of thermo setting or of thermo plastic, a layer of woven fabric, a layer of abrasive material, preferably in the form of grains, and an adhesive, preferably having thermo setting properties, between the layers. The member may be self supporting or have an inner layer of synthetic plastics material to add strength and rigidity. During a heating stage, according to the method of forming such members of the invention, the components are bonded together and at the same time, or during a separate stage, the resultant strip is deformed to a shape which permits attachments and removal to or from the grating.

A grating having a rectangular mesh pattern which consists of small flats standing on edge in spaced relation and joined laterally by cross bars arranged at right angles to the flats may have members according to the invention attached to the bearing edge surfaces of the flats to provide a non-slip or slip-resistant surface to the grating. Alternatively, a grating having a diamond mesh pattern which consists of small section flats standing on edge, arranged in spaced relation by corrugated flats and the whole joined together by welding or rivetting also may have members attached to the bearing edge surfaces of the flats to provide a nonslip or a slip-resistant surface.

The invention will now be described by way of example with reference to the accompanying drawing in which:

FIG. 1 shows a grating having a diamond mesh pattern provided with non-slip or slip-resistant members,

FIG. 2 is a view similar to FIG. 1 but of a grid having a rectangular mesh pattern,

FIG. 3 shows the members of FIG. 1 on an enlarged scale, and,

FIG. 4 shows an alternative construction of a member as shown in FIG. 2.

In each of FIGS. 1 and 2 there is shown a grating having up-standing members 1 arranged in parallel relation and joined by bars 2 so as to form a lattice work. The members 1 are each provided with non-slip or slip-resistant members 3 which are in the form of clips. FIG. 1 shows one form of clip and FIG. 2 shows an alternative form. As will be appreciated the two forms may be interchanged or both forms used on the same grating.

In FIG. 3 there is shown a clip 3 which is provided by a strip of a synthetic plastics material 4 such as polyvinylchloride or similar thermo plastic material and, extending longitudinally of the strip and substantially overlying the centre line but not necessarily extending to the longitudinal edges of the strip, a further strip of woven fabric 5 is attached to the first strip by an adhesive (not shown) preferably having thermo setting qualities. A further layer of adhesive (not shown) and again preferably having thermo setting qualities, is applied to the fabric and an abrasive material 6, such as in the form of grains, is applied over the adhesive. Heat is then applied so that the whole is bonded together to form a single strip. During the heating stage, the strip is bent in the form of an inverted U-shape to provide the clip. If desired the bending may be provided as a separate operation.

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In an alternative construction the clip of FIG. 3 is provided by placing one surface of a woven fabric base 5 in the form of a strip on a layer of thermo setting or thermo synthetic resin plastic material 4 and on the other surface of the fabric base a layer of abrasive grains 6. On heat being applied, the synthetic plastic material flows through the weave of the fabric base into contact with the abrasive grains and on curing the whole provides a single strip. During this operation the strip is bent in the longitudinal direction to provide in cross section a substantially inverted U-shape with the thermo setting or thermo plastic resin type material 4 on the inside which adds strength and rigidity to the resultant clip.

Alternatively the abrasive may be affixed directly to the spine of the clip by means of a suitable adhesive without interposing a fabric layer or where a thermo-setting material is used, the abrasive may be impressed into the spine of the clip before the final curing is complete. Preferably the spine of the clip is of increased thickness so as to provide an area for accepting the abrasive grains.

In FIG. 4 there is shown a clip 10 of a metal, for example spring steel, to which spring characteristics may be imparted by heat treatment after the clip has been formed. The spine 11 of the clip 10 is provided with a series of projections 12 which as shown are in the form of hollow truncated cones but may be of other shapes. The punching and forming of the projections provides a sharp edge and by subsequent heat treatment the resistance to wear may be increased.

In use, a clip such as shown in FIGS. 3 or 4 is placed over the members 1 of the grating shown in FIG. 1 or FIG. 2 and due to the shape and resilience of the material the clip has a spring action which assists in retaining a clip in position. By arranging several clips in spaced relation a definite non-slip surface is provided. As will be appreciated, it is only necessary to apply clips to certain areas where there is a definite slip hazard. Such

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clips may be applied to new gratings or gratings which are in use and may be applied by unskilled labour. Also, the clips may be used on gratings of different materials, for example gratings of metal, wood or synthetic plastics material. Clips are readily removable when it is necessary for replacement or repair by simply withdrawing the clip which springs free from the bars of the grating.

The clips do not alter the general design features of the grating and due to their size do not noticeably impede light or air through the gratings.

Clips manufactured from synthetic plastics material may be less expensive than clips manufactured from metal but the latter are more practical where extreme heat may be applied which would damage synthetic plastics material. The clips, although being designed to retain their position by a spring clip action, may be attached in position by a suitable adhesive.

I claim:

1. A load bearing grating including a plurality of flat strips arranged to stand on edge in spaced relation and a plurality of cross bars interconnecting said strips in combination with one or more elongated, slip-resisting, clip members of inverted U-shape transverse cross section detachably mounted on said flat strips, each of said clip members including a pair of downwardly extending sides for gripping opposite faces of said flat strips substantially below an upwardly facing edge thereof and a bight portion joining said sides and resting on an upper edge surface of said flat strip, and slip resistant, friction increasing means on the upwardly facing surface of said bight portion of said clip member for providing a slip resistant treat surface for said grating, said clip member including an inner layer of synthetic plastics material, an intermediate layer of woven fabric, an outer layer of abrasive material with adhesive between said layers for securing the layers into an integral detachable clip member.

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