July 14, 1964 R. B. LEE 3,140,644

NON-SKID GRATING

Filed May 28, 1962 2 Sheets-Sheet 1

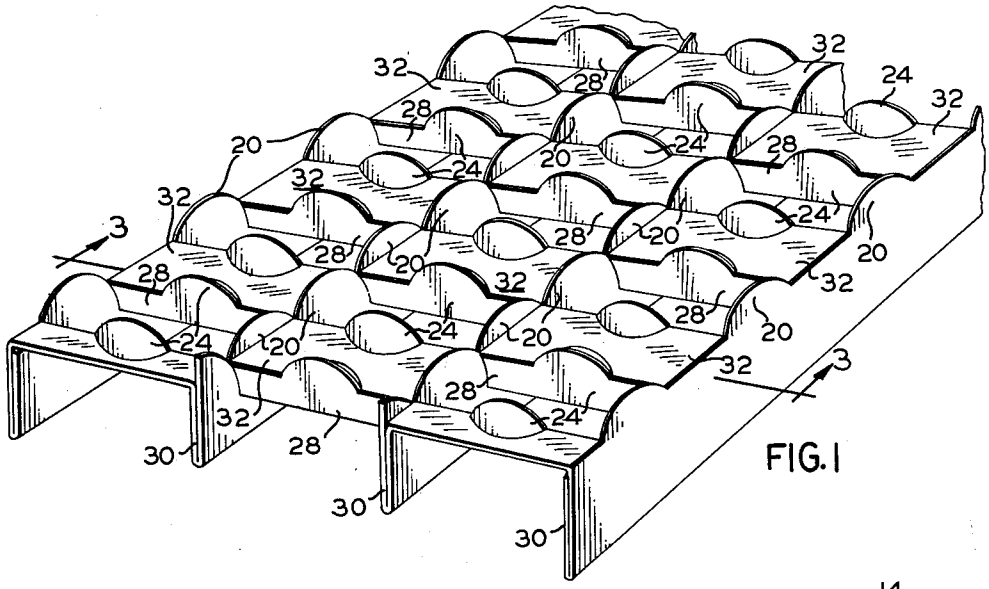

FIG. 1

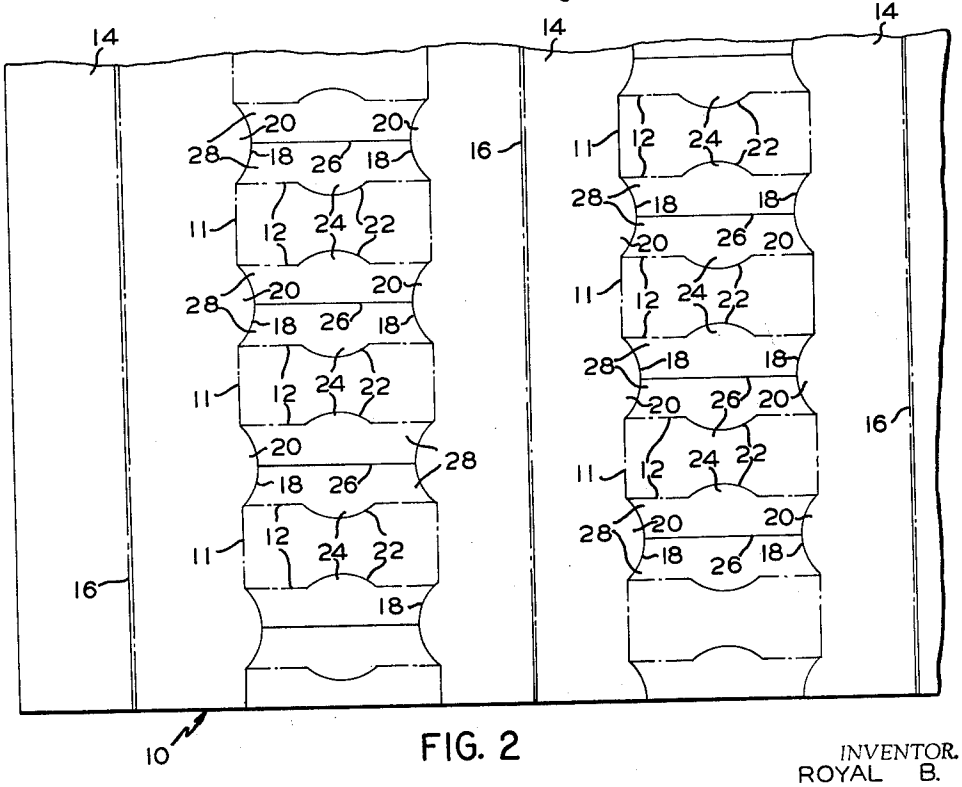

FIG. 2

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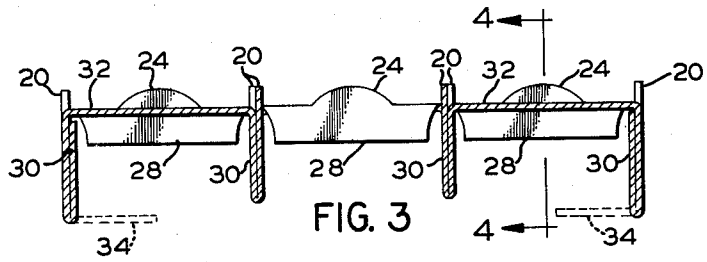

FIG. 3

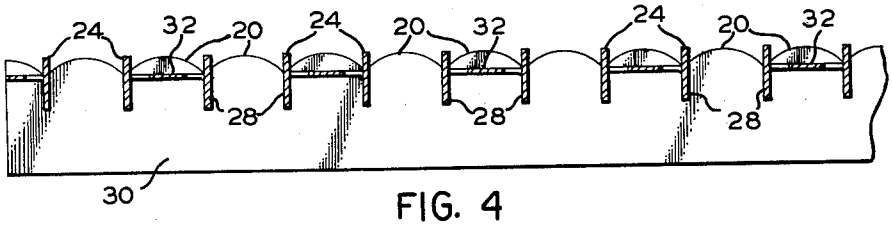

FIG. 4

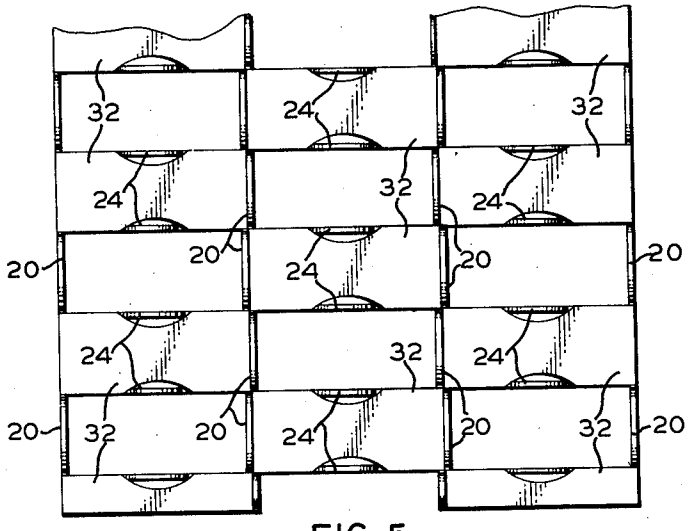

FIG. 5

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3,140,644

NON-SKID GRATING

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Filed May 28, 1962, Ser. No. 198,076
6 Claims. (Cl. 94—30)

The present invention relates generally to floor and tread structures and more particularly to a non-skid grating.

The primary object of this invention is to provide a non-skid grating incorporating a reticulated arrangement of upstanding tabs forming a raised tread surface having frictional gripping qualities in any direction.

Another object of this invention is to provide a non-skid grating which can be cut or stamped from a single sheet of material and formed by simple bending, the finished grating having longitudinal stiffening ribs and transverse reinforcing flanges.

Another object of this invention is to provide a non-skid grating which is self-supporting and does not specifically require bolting, welding, or any other type of securement to maintain its form.

A further object of this invention is to provide a non-skid grating which can be made in a variety of sizes for floors, stair treads, or insert panels in floor structures, and other uses.

Finally, it is an object to provide a non-skid grating of the aforementioned character which is simple and convenient to manufacture and install and which will give generally efficient and durable service.

With these and other objects definitely in view, this invention consists in the novel construction, combination and arrangement of elements and portions, as will be hereinafter fully described in the specification, particularly pointed out in the claims, and illustrated in the drawings which form a material part of this disclosure, and in which:

FIGURE 1 is a perspective view of a portion of the grating;

FIGURE 2 is a plan view of the blank sheet ready for forming;

FIGURE 3 is a sectional view taken on line 3—3 of FIGURE 1;

FIGURE 4 is a sectional view taken on line 4—4 of FIGURE 3; and

FIGURE 5 is a top plan view of a portion of complete grating.

In the following explanation and claims the terms "longitudinal" and "transverse" will be used somewhat arbitrarily in the interest of simplicity and clarity, although it is conceived that the grating will usually, although not necessarily, be constructed in oblong sections for installation with ribs formed by downward bending, as hereinafter more fully described, extending longitudinally of the oblong sections.

The grating is made from a single flat sheet of metal **10**, as in FIGURE 2, all structure being made by simple cuts and bends. In layout, the sheet is divided into spaced parallel rows of equal rectangular areas having their long dimensions transversely of the rows, the rectangles being indicated as substantially bounded by single broken lines **11** and **12** which represent downward bends. Between the rows of rectangles are stiffener portions **14**, along the center lines of which are indicated double broken lines **16** representing upward bends. Every alternate rectangle in a particular row has at its ends inwardly extending opposed arcuate cuts **18** forming tabs **20** and at the center of the sides of each such rectangle are outwardly extending opposed arcuate cuts **22** forming tabs **24**. In addition the arcuate cuts **18**, in each said alternate rectangle, are connected by a central transverse cut **26** bisecting the mentioned rectangle and forming

a pair of flanges **28**. It should be noted that bend lines **11** and **12** do not extend chordally across tabs **20** and **24**, which are not to be bent. Each row of rectangles is treated in a similar manner but the bisected rectangles are longitudinally staggered in adjacent rows.

The grating is formed by making the longitudinal bends downwardly along bend lines **11** and upwardly along bend lines **16**. This forms the stiffener portions **14** into return folded longitudinal ribs **30**, which may be considered primary load bearing members, the tabs **20** being allowed to remain coplanar with said ribs and these tabs therefore project upwardly. The flanges **28** are then bent downwardly along bend lines **12**, allowing tabs **24** to remain coplanar with the flanges and project upwardly, as in FIGURES 3 and 4. In the resultant structure the top face of the grating is composed of alternate rectangular openings and planar platform portions **32**, the flanges **28** depending on opposite sides of said platform portions. Due to the staggering of the cut out portions in adjacent rows the tabs **20** form continuous rows along the top of ribs **30**, while tabs **24** are spaced in transverse rows, in a reticulated pattern. The tabs **20** and **24** thus constitute small scraper type elements arranged orthogonally to provide friction in any direction against the soles of shoes or boots.

For mounting purposes the stiffener portions along one or both of the outside edges of the grating may be bent to provide inwardly turned attachment flanges **34**, as indicated in broken line in FIGURE 3, instead of being return folded. In wide, multiple grating assemblies the return folded ribs **30** of adjoining panels may be interconnected, or the attachment flanges **34** provided on some grating panels may be used for tie down purposes.

If the sheet material from which the grating is made is of sufficient thickness and strength, the arrangement of the folded portions will be of ample rigidity when the grating is properly secured to suitable supports. However, for particularly heavy duty use the double walls of the ribs **30** may be welded together at intervals for additional strength. In any event, no complex shaping apparatus is necessary and there are no separate parts to be aligned and assembled. The simple structure allows considerable latitude in the steps of the manufacturing process to suit available equipment. The arcuate tabs **20** and **24** are particularly effective in regard to strength, since they have a maximum base area of connection with the main structure, but have no sharp corners to become bent or broken off.

The grating can be made in various sizes and used singly as stair treads or inserts in floors, or can be assembled to form entire floors, walkways and the like. Many different types of supporting structures and attachment means may be used. In a modified embodiment, a nosing or plain area may be provided along one or both longitudinal edges of the grating. This may be accomplished by merely increasing the width of the flat portion at either edge of the grating. An abrasive nosing plate could be secured when desired.

In order to conserve material and to reduce weight, the ribs **30** in the intermediate portions of the grating may be of lesser vertical dimension than the ribs at the outside longitudinal edges of the grating. This is accomplished by reducing the width of the corresponding stiffener portions **14** prior to the bending thereof into rib form. The depth of the intermediate ribs tends to be fixed or dictated by strength considerations but the outside ribs could in some instances be of lesser depth when, for example, these outside ribs rest on strong sills or the like. It is also conceived that a grating of similar configuration can be achieved by molding from powdered metal or non-metallic material.

It is understood that still other minor variations from

the form of the invention disclosed herein may be made without departure from the spirit and scope of the invention, and that the specification and drawings are to be considered as merely illustrative rather than limiting.

I claim:

1. A non-skid grating, comprising:

a unitary sheet element having a plurality of spaced, longitudinal return folded ribs;

rows of longitudinally spaced, substantially coplanar platform portions between said ribs and having openings therebetween;

said ribs having upwardly projecting tabs at the ends of said openings;

and said platform portions having upwardly projecting tabs at the sides thereof normal to said first mentioned tabs and constituting therewith a reticulated array of non-skid elements.

2. A non-skid grating according to claim 1, wherein said tabs are substantially arcuate.

3. A non-skid grating, comprising:

a unitary sheet element having a plurality of spaced, longitudinal return folded ribs;

rows of longitudinally spaced, substantially coplanar platform portions between said ribs and having openings therebetween;

said ribs having upwardly projecting tabs at the ends of said openings;

said platform portions having downwardly extending flanges along opposite sides thereof between said ribs;

and said platform portions having upwardly projecting tabs integral with said flanges normal to said first mentioned tabs and constituting therewith a reticulated array of non-skid elements.

4. A non-skid grating, comprising:

a unitary sheet element having a plurality of spaced, longitudinal return folded ribs;

rows of longitudinally spaced, substantially coplanar platform portions between said ribs and having openings therebetween;

said ribs having upwardly projecting tabs at the ends of said openings;

said platform portions having downwardly extending flanges along opposite sides thereof between said ribs;

said platform portions having upwardly projecting tabs integral with said flanges normal to said first mentioned tabs and constituting therewith a reticulated array of non-skid elements;

the platform portions being longitudinally staggered in adjacent rows, whereby said first mentioned tabs form continuous longitudinal rows.

5. A non-skid grating according to claim 4, wherein said ribs at the outer edges of the grating have inwardly turned attachment flanges.

6. A non-skid grating according to claim 4 wherein said ribs are of different vertical dimension, the depth of the ribs at the longitudinal edges of the grating being determined to accommodate the grating to the particular supporting structure whereon the grating is to rest, the depth of the remaining intermediate ribs being determined solely by strength requirements thereof as primary load bearing members, whereby the weight of the grating and the amount of material used in fabrication thereof can be minimized.

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