

April 23, 1968

J. E. SCHOLL

3,379,104

CONNECTION MEANS FOR LANDING MAT SECTIONS

Filed March 15, 1966

6 Sheets-Sheet 1

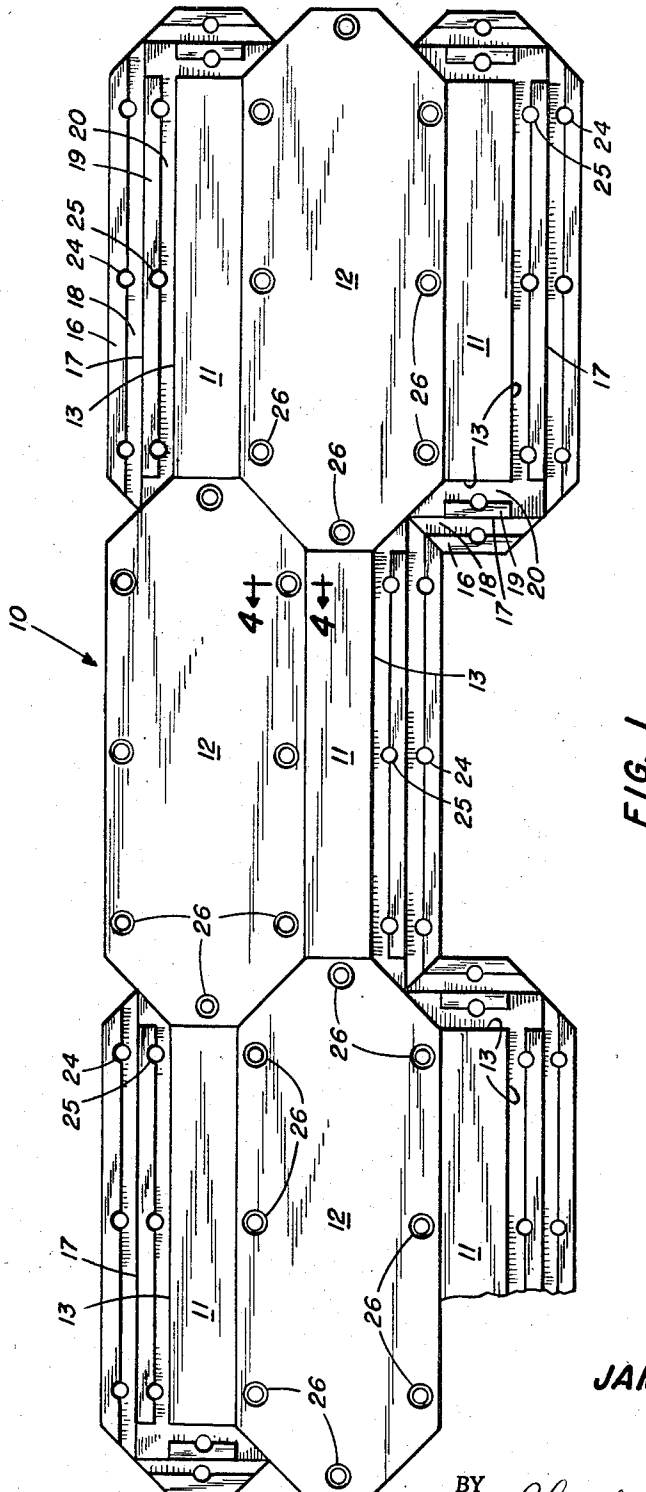


FIG. 1

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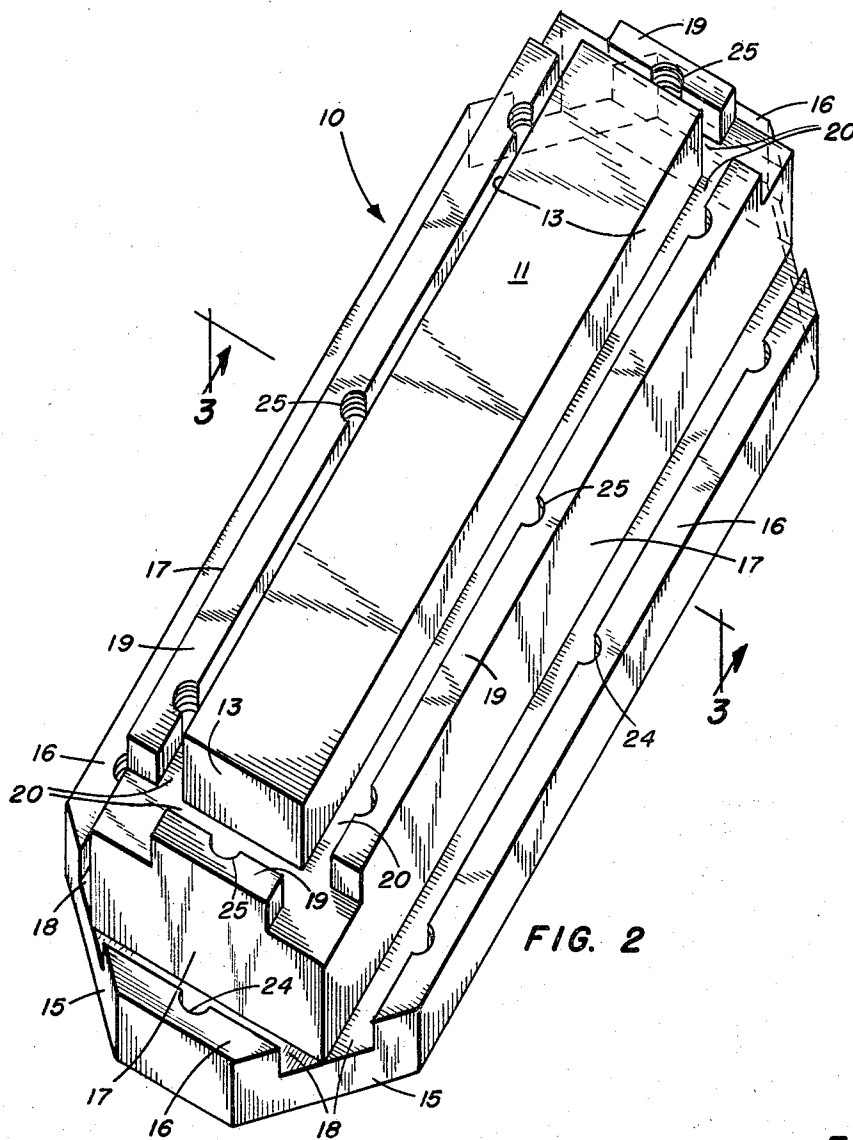
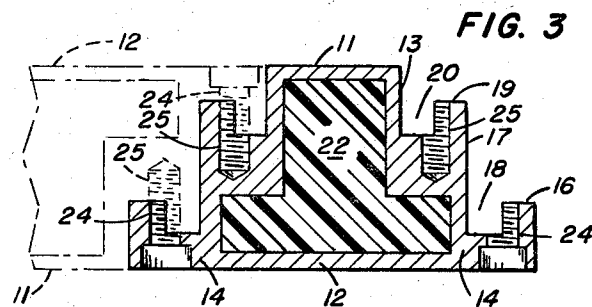
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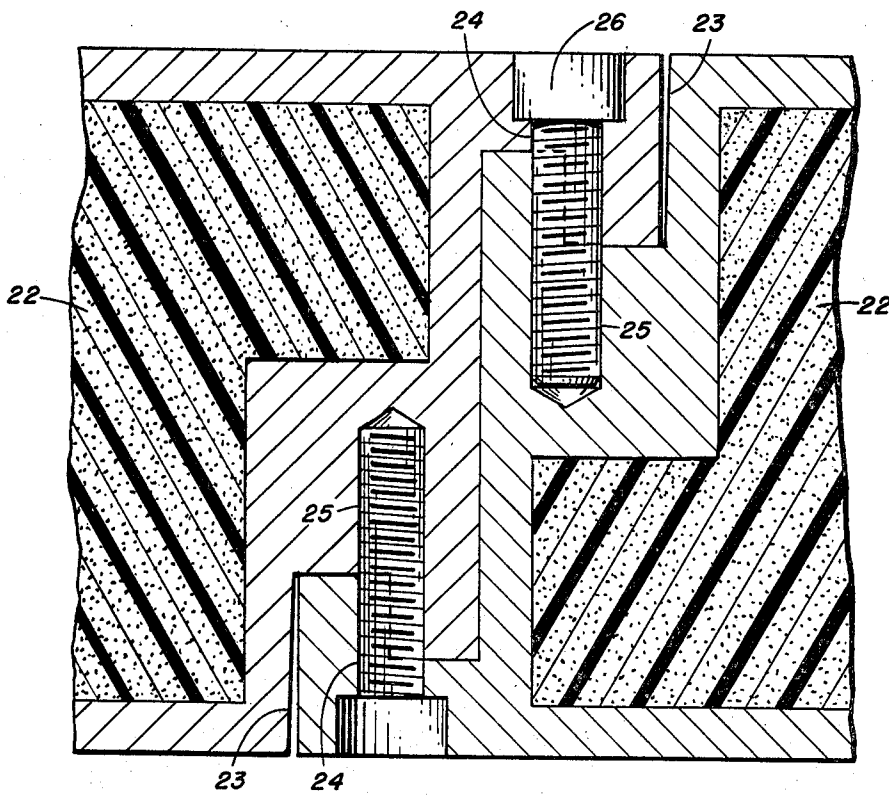


FIG. 4

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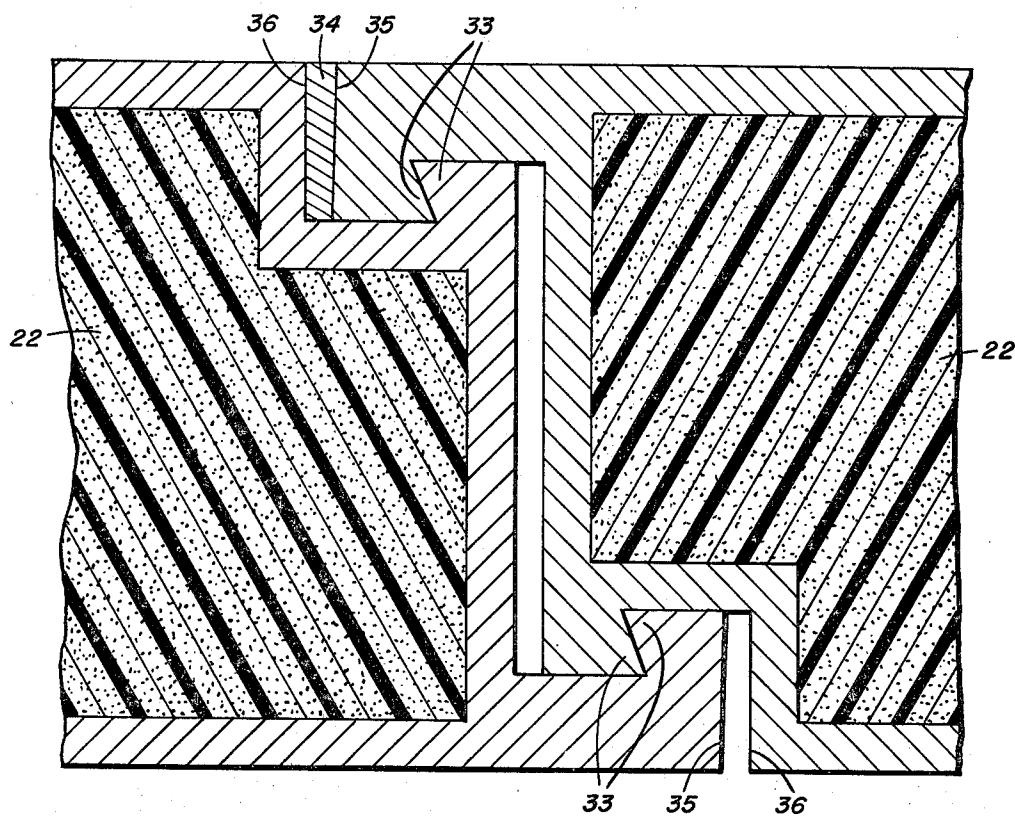


FIG. 5

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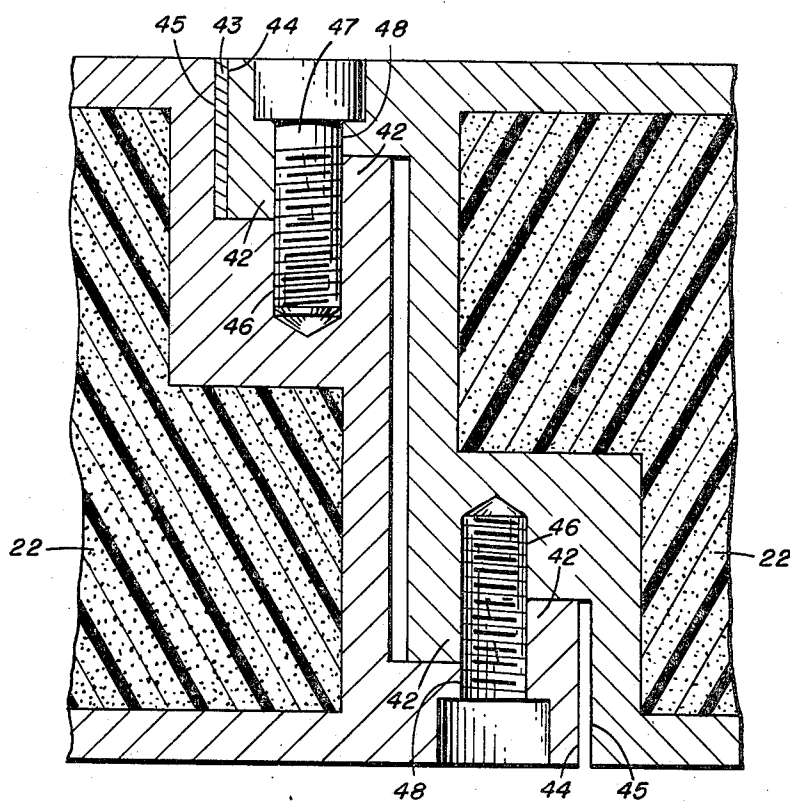


FIG. 6

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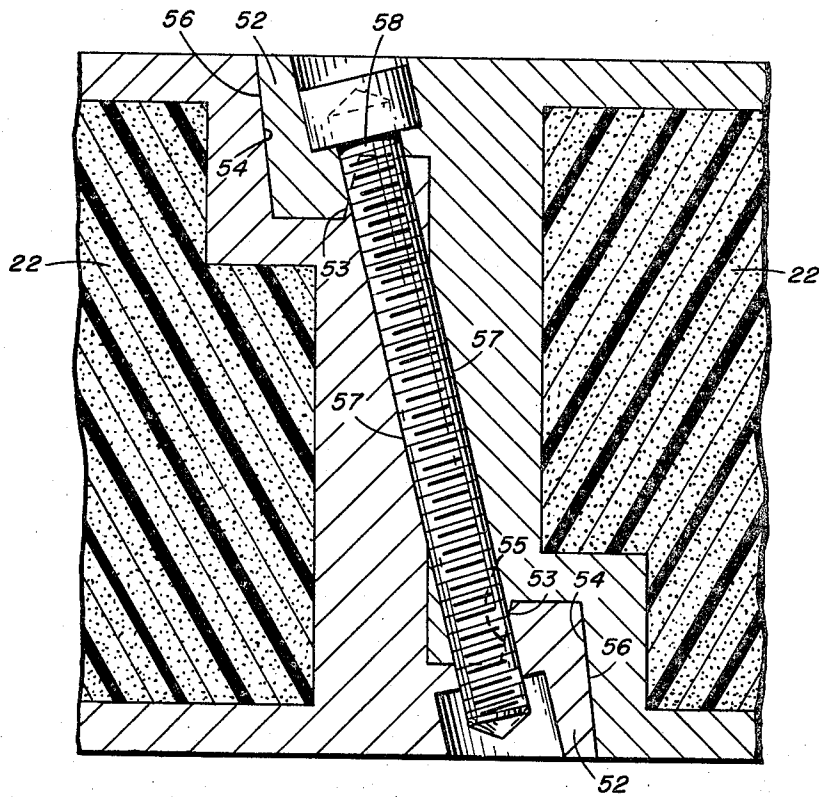


FIG. 7

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CONNECTION MEANS FOR LANDING MAT SECTIONS

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4 Claims. (Cl. 94—13)

ABSTRACT OF THE DISCLOSURE

A landing mat formed of interlocking sections, each section being formed with one substantially flat smooth surface, its opposite surface having an inner flat, smooth rectangular area, a peripheral rib spaced from the inner area by a peripheral groove, the rib being of lesser thickness than the inner area and a second peripheral rib spaced from the first rib by a second peripheral groove, the second rib being of least thickness, the sections being used with ribs interlocking with grooves of adjacent sections to leave the flat smooth surface and the inner smooth area exposed.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

The present invention relates to landing mats of the type to be used as temporary landing fields for aircraft and, more particularly, to the way in which the mats are connected together.

In the typical case, a temporary landing field may be made from a plurality of landing mats arranged in a brick-work pattern. These mats are interconnected by a suitable means so as to form a rigid load bearing structure. The ease and speed with which the mats are interconnected are directly dependent upon the type of connecting means employed.

Accordingly, it is an object of the present invention to provide panel sections which can be rapidly connected together and locked in position.

Another object of the present invention is to provide peripheral joint and locking means for panel sections which will allow identical panel sections to be interconnected and locked together.

Still another object of the present invention is to provide panel sections which can be connected together to form a flat load supporting structure and which panel sections can be locked in interconnected position from either side of the structure.

Yet another object of the present invention is to provide landing mat sections which can be interconnected and locked together to form a landing area for aircraft.

Another object of the present invention is to provide landing mat sections having peripheral joints which will interconnect with similar mat sections having the identical peripheral joint.

A still further object of the present invention is to provide landing mat sections having peripheral joints for interconnecting identical mat sections and locking means for holding the mat sections in interconnected position.

Other objects, advantages and novel features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings wherein:

FIG. 1 is a top view of several landing mat sections interconnected together;

FIG. 2 is a perspective view of one of the landing mat sections;

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FIG. 3 is a cross-sectional view taken along line 3—3 of FIG. 2;

FIG. 4 is a cross-sectional view taken along line 4—4 of FIG. 1;

FIG. 5 is a view similar to FIG. 4 but showing a modified joint and locking means;

FIG. 6 is a view similar to FIG. 4 but showing another modified joint and locking means; and

FIG. 7 is a view similar to FIG. 4 but showing still another modified joint and locking means.

Referring now to FIGS. 1 and 2, it will be seen that the temporary landing field, which could typically be for either helicopters or conventional aircraft, is composed of a plurality of interconnected mat sections 10 which form a flat platform. Each of these mat sections are, for example, composed of hollow aluminum panels having a honeycomb construction inside and filled with premolded blocks of polyurethane. Each mat section is approximately 8 feet long, 3 feet wide and 5 inches thick, however, the drawings are shown greatly out of proportion in order to show the peripheral joints in greater detail. Along each of the four edges of the mat sections there is formed a connecting means made up of two parallel spaced ribs 16, 19 and two channels 18, 20 (FIG. 3) along each edge of the mat section. The joints of the adjoining mat sections are interconnected by having the ribs of one joint engaging the channels of the adjacent joint and the interconnected mat sections are locked in position by screw means 26.

Each mat section 10 is generally rectangular in shape and has both an upper face 11, a lower face 12 and four side walls 13. Projecting outwardly from the sides of the lower portion of the mat section there is formed a thin flat rim 14 which is flush with the lower face of the mat section. The rim extends equally around the mat section and is generally rectangular in shape except for four 45° mitered corners 15. The sides of the rim are parallel to the sides of the mat section and the mitered corners cut the sides of rim 14 down to where they are coextensive in length with the respective parallel sides of the mat section. Extending upwardly, substantially perpendicular to and along each side of the rim, there is positioned an exterior rib 16 which is parallel to one of the sides of the mat section. The ribs extend along the entire length of each of the four sides of the rim and terminate at the mitered corners. There is also projecting outwardly around the sides of the mat section a rectangular platform 17 which is in contact with the rim and which extends upwardly to a point below the top surface of the mat section. The platform extends symmetrically around the mat section and is positioned such that the corners of the platform are on-line with the mitered corners of the rim and the sides of the platform are spaced from the exterior ribs. This spaced relationship between the side walls of the platform and the exterior ribs in combination with the upper surface of the rim forms four exterior channels 18 which are substantially parallel to the sides of the mat section. Extending upwardly substantially perpendicular to the top surface of platform 17 and along each side of the platform there is formed an exterior rib 19. Each of these ribs are both parallel with and coextensive in length with one of the sides of the mat section. Furthermore, each of the ribs are spaced from the side walls of the mat section so as to form four interior channels 20.

The interior ribs 19 and interior channels 20 form an upper elongated male and female connecting or joint means which are on the peripheral sides of the mat section. Likewise, the exterior ribs 16 and channels 18 form a lower elongated male and female connecting or joint means. It will be apparent that the upper and lower connecting means are arranged in a stepped arrangement such

that a second mat section having the identical connecting means can be inverted and joined in a complementary manner so as to form a flat structure. Furthermore, it is because of the specific mitered corner construction that a plurality of mat sections having the identical peripheral connecting means can be interconnected to form a solid platform.

In laying a typical airfield a first mat section is placed with the top surface facing upwardly and four similar mat sections with their top surfaces facing downwardly are then connected at each side of the first mat section. When the mat sections are interconnected in the proper manner, the interior and exterior ribs of one mat section interconnect with the exterior and interior channels, respectively, of the other mat section. The interconnected mat sections are then locked in place, as will hereinafter be described, and additional mat sections are joined to the structure. Work on the landing field can thus proceed from this first mat section outwardly in all four directions simultaneously.

Numerous types of joints and locking means may be employed with the mat sections in practicing the disclosed invention, however, the following is a description of the preferred embodiments.

In FIG. 4, there is shown two mat sections connected together by ribs and channels of generally rectangular cross-section and having a screw type locking means. Each mat section is hollow and has molded polyurethane blocks 22 on the inside. The exterior and interior ribs, as well as the exterior channels of both mat sections, are generally rectangular in cross-section. The side 23 of the interior channel of each mat section can be slightly tapered in order to act as a guide means for receiving the exterior rib of the adjoining section. A plurality of countersunk tapped holes 24 are provided along each edge of the mat section and extend from the lower surface of the mat section through the exterior joint means. There is also provided a plurality of tapped holes 25 along each of the interior joint means of the mat section. When two interconnected mat sections are in the proper position, the holes in the exterior joint means of one section are aligned with the holes in the interior joint means of the other section and screws 26 can be inserted to lock the mat sections into a rigid structure. While the aligned holes permit the insertion of screws 26 from both sides of the structure, it is contemplated that the screws will only have to be inserted from the top of the resulting structure and thereby greatly simplify the process of locking the interconnected mat sections in position.

The structure in FIG. 5 shows the mat sections having interconnected dovetail ribs locked in position by a shim means. Each rib has a dovetail portion 33 which forms the adjacent dovetail-shaped channel. The width of each of the ribs is smaller than the width of the channels so as to enable the joints to be readily connected. The locking means are shims 34 which are of a width approximately equal to the difference between the width of the ribs and the width of the channels. The shims are designed to be forced into the space between the outside surface 35 of the rib and the flat side wall 36 of the interior channel as shown in FIG. 4. The resulting structure is a planar load-bearing surface. The shims can be of a length equal to the length of the sides of the mat section or they can be of a short uniform length in which case a plurality of shims can be inserted along each side of the interconnected mat section.

In FIG. 6, there is disclosed a dovetail rib construction similar to that shown in FIG. 5 except that the interconnected joints are provided with two different types of locking means which can be used independently or in combination. The ribs of each section are similar to those shown in FIG. 5 in that they are provided with a dovetail portion 42 and are of a smaller width than the width of the channels. Shim type locking means 43 are provided for insertion into the slot formed by the outside surface 44 of

the exterior rib of one section and the flat side wall 45 of the interior channel in the second section. There is also a screw locking means which is essentially the same as that shown in FIG. 4 in that each mat section has a plurality of countersunk tapped holes 45 along each edge of the mat at the exterior joint means and a plurality of tapped holes 46 in the interior joint means. When two identical mat sections are properly interconnected, the holes in the exterior joint means of one section are aligned with the holes in interior joint means of the other section and screws 47 can be inserted to lock the interconnected mat sections into a rigid structure. Thus, with the mat section shown in FIG. 6, it will be apparent that either the shim means or the screw means can be used independently or in combination to lock the mat sections in position.

In FIG. 7, there is shown two mat sections interconnected by frustum-shaped joint means and locked in place by screw locking means positioned at an angle to the assembled sections. The exterior ribs 52 of each section are formed with tapered sides 53, 54. In a like manner, the side walls 55, 56 of the interior channel of each section are tapered so as to allow the reception of the frustum-shaped exterior rib of an identical mat section. The locking means for the mat sections comprise a plurality of equally spaced countersunk and tapped holes 57 along each side of a mat section and extending from the lower face of the mat section at an angle through both the exterior and interior joint means. When the interconnected mat sections are in the proper position, the holes will be aligned so as to permit screws 58 to be inserted at an angle to the top surface of the resulting structure and thereby securely locking the sections in place.

There is thus provided a mat section which, because of the stepped arrangement of the peripheral joint means and the mitered corner construction, can be rapidly assembled with identical mat sections to form a temporary landing field for aircraft. Furthermore, there is provided a number of specific joint designs which allow the mat section to be quickly joined together and which permit different type locking means to be easily inserted from the top surface of the resulting structure. The description of the mat sections for landing fields is for illustrative purposes only and it will be apparent that the panel construction with peripheral connecting means could also be advantageously employed in, for example, prefabricated structures and temporary roadways.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

I claim:

1. A landing mat formed of a plurality of sections, each section comprising:

55 a substantially rectangular structure having mitered corners and formed with one substantially flat smooth surface, the opposite surface having an inner rectangular smooth area of full thickness, a peripheral rib extending around the inner area and spaced therefrom by a peripheral groove, said rib being of lesser thickness than the central area, a second peripheral rib extending beyond the first rib and spaced therefrom by a second peripheral groove, said second rib being of least thickness, the sections to be interlocked, ribs with grooves of adjacent sections so as to leave their flat surfaces and their inner smooth areas exposed to form substantially smooth surfaces.

2. A landing mat according to claim 1 and including means for securing opposed sections to each other.

3. A landing mat according to claim 1 wherein the sections are substantially hollow.

4. A landing mat according to claim 3 wherein the hollow interior is filled with molded polyurethane blocks.

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JACOB L. NACKENOFF, *Primary Examiner.*