

“Working Platform”**Field of the Invention**

This invention relates to the field of temporary structures for providing work platforms, and to a method of providing a work platform.

5 Background Art

Temporary work platforms have traditionally been provided in various manners, most commonly through static methods such as use of scaffolding which is erected around structures, and through mobile means such hydraulically controlled platforms such as those commonly known as cherry-pickers. A
10 difficulty with scaffolding is that it is time-consuming to erect. It is not always possible to easily erect scaffolding in some situations. Similarly, it is not always possible to use cherry-pickers, particularly where access to locate a cherry-picker is problematic.

It is an object of the present invention to provide an alternative work platform
15 arrangement, that obviates some of the aforementioned problems.

Throughout the specification, unless the context requires otherwise, the word “comprise” or variations such as “comprises” or “comprising”, will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

20 Disclosure of the Invention

In accordance with one aspect of the present invention there is provided a platform for use as a temporary support structure, said platform comprising an expanse of netting having a border rope fitted thereto around the outer periphery thereof, and at least one inner rope fitted to said netting, extending around, inside
25 and spaced from said border rope, and spaced from any other said at least one inner rope.

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Preferably said at least one inner rope is spaced evenly from said border rope, in concentric manner.

Preferably said at least one inner rope is spaced evenly from any other said at least one inner periphery rope, in concentric manner.

- 5 Preferably said border rope is woven through the mesh of said net.

Preferably said border rope is attached to said netting.

Preferably said border rope is attached to said netting by being stitched thereto, at least where said border rope intersects said netting.

- 10 Preferably each said at least one inner rope is woven through the mesh of said net.

Preferably each said at least one inner rope is attached to said netting.

Preferably each said at least one inner rope is attached to said netting by being stitched thereto, at least where any said at least one inner rope intersects said netting.

- 15 Preferably the border rope has its ends spliced together.

Preferably each said at least one inner rope has its ends spliced together. Splicing provides for increased strength.

Preferably the border rope is a three strand twisted rope.

Preferably the border rope has a minimum diameter 8mm.

- 20 Preferably the border rope has a minimum diameter of 10mm.

Preferably the border rope has a diameter of from 12mm to 22mm.

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Preferably the border rope has a diameter of from 14mm to 20mm.

Preferably the border rope has a diameter of from 15mm to 18mm.

Preferably the border rope has a diameter of about 16mm.

Preferably the each said at least one inner rope is a three strand twisted rope.

- 5 Preferably each said at least one inner rope has a minimum diameter 8mm.

Preferably each said at least one inner rope has a minimum diameter of 10mm.

Preferably each said at least one inner rope has a diameter of from 12mm to 22mm.

- 10 Preferably each said at least one inner rope has a diameter of from 14mm to 20mm.

Preferably each said at least one inner rope has a diameter of from 15mm to 18mm.

Preferably each said at least one inner rope has a diameter of about 16mm.

Preferably said border rope is formed of polypropylene.

- 15 Preferably each said at least one inner rope are formed of polypropylene.

Preferably said net is formed of thread having a diameter of from 2.0mm to 6.0mm.

Preferably said net is formed of thread having a diameter of from 2.0mm to 4.0mm.

- 20 Preferably said net is formed of thread having a diameter of from 2.5mm to 3.0mm. A three ply thread is preferred, most preferably of polyethylene.

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Preferably said net has a square mesh.

Alternatively said net has a rhomboid shaped mesh.

Preferably said border rope is woven through the mesh of said net passing over two strands of said net at a time. This may occur where two strands intersect (as
5 in strands that equate to a warp and a weft).

Preferably each said at least one inner rope is woven through the mesh of said net passing over two strands of said net at a time. This may occur where two strands intersect (as in strands that equate to a warp and a weft).

Preferably the mesh of said net is knotted. This provides increased strength, and
10 provides for ease of repair.

Preferably said mesh has apertures of from 25mm to 60mm wide and high, in each direction.

Preferably said mesh has apertures of from 30mm to 50mm wide and high, in each direction.

15 Preferably said mesh has apertures of from 35mm to 45mm wide and high, in each direction.

Preferably said mesh has apertures of from 38mm to 40mm wide and high, in each direction.

Preferably said platform includes at least one additional rope fitted to said netting,
20 extending across said netting, intersecting said inner rope(s) and said border rope.

Preferably said additional ropes are woven through said netting.

Preferably said additional ropes are attached to said netting.

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Preferably said additional ropes are attached to said inner rope(s) and said border rope..

Preferably said additional ropes are attached to said netting by being stitched thereto, at least where said additional ropes intersect said netting.

- 5 The additional ropes may be of the same type as the border and inner ropes.

Also in accordance with the invention, there is provided a method of providing a work platform, said method including supporting a platform as described above from support ropes extending from said border rope at the edge of said platform and/or said inner ropes to convenient anchor points of a structure.

- 10 Preferably said support ropes comprise two peripheral ropes extending along opposite edges of said platform, and secured to said platform in positions located in spaced relation.

Preferably said support ropes include individual ropes extending from positions spaced apart from each other, along edges of said platform. Preferably said

- 15 support ropes are secured to said border rope.

Preferably said support ropes are secured under tension. Tensioning may be provided using winches.

- 20 Preferably said support ropes include further support ropes secured to a said at least one inner rope. Such securing may be by way of hooks. The use of further support ropes in this manner allows predetermined portions of the platform to be tensioned, for supporting of extra load, such as where equipment is to be supported, or where two or more personnel need to work together.

- 25 The method may further include provision of additional support ropes, strung underneath the platform. In addition or alternatively to this the method may include the provision of support webbing which is located under the platform. Support webbing can provide additional rigidity to the platform. The support

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webbing is preferably formed of 50mm wide nylon or Kevlar strapping, woven in a weave spaced 100mm apart to form 100mm x 100mm apertures, and stitched at each cross-over. Either additional features provide additional support so that rigid planks or aluminium sections can be placed on platform to provide a rigid surface
5 for supporting equipment.

Brief Description of the Drawings

A preferred embodiment of the invention will now be described in the following description made with reference to the drawings in which:

Figure 1 is a plan view of a work platform according to the embodiment,
10 showing attachment of the work platform to two structures in the form of two opposed walls;

Figure 2 is a part view of a longitudinal edge of the work platform of figure 1;

Figure 3 is a part view of a tensioning arrangement for the work platform;
and

15 Figure 4 is a plan view of webbing which may be optionally utilised underneath the work platform of the embodiment..

Best Mode(s) for Carrying Out the Invention

The embodiment is a platform 11 for use as a temporary support structure for supporting workers and equipment. The platform 11 comprises a rectangular
20 expanse of square shaped netting 13 and has a border rope 15 woven through adjacent holes of the netting 13, alternating to opposite sides of the netting 13. The border rope 15 extends around the periphery of the netting 13, and forms a primary support through which the platform 11 may be attached to an external structure 17. The ends of the border rope 15 are joined by splicing together, so
25 that a join of good strength is formed. In addition to this, the border rope 15 is secured to the netting by being sewn thereto. It should be noted that while the netting 13 appears rhomboid in figure 1, this is due to the platform being distorted when tensioned.

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The platform 11 includes three inner ropes 19, 21, 23 extending located spaced from each other and from the border rope 15 in concentric manner. Each inner rope 19, 21, 23 is also woven through adjacent holes of the netting 13, alternating to opposite sides of the netting 13. The ends of each inner rope 19, 21, 23, are
5 joined by splicing together, so that joins of good strength are formed. In addition to this, the inner ropes 19, 21, 23 are secured to the netting by being sewn thereto. The platform 11 also includes two diagonally extending ropes 24 which extend across the netting 13, from opposed corners. These diagonally extending ropes 24 are located underneath the netting, and need not be woven through the
10 netting, although they can be woven if required. Similarly, these diagonal ropes may be sewn to the other ropes and the netting, where they intersect.

The border rope 15, each inner rope 19, 21, 23, and each diagonally extending rope 24 is a three strand twisted rope formed of polypropylene, and having an overall diameter of about 16mm.

15 The netting 13 is formed of three ply polyethylene thread having a diameter of from 2.5mm to 3.0mm, and has a mesh of square shape as stated above. The mesh size is about 38mm wide and high (distance measured from side to side and not point to point). The mesh of the netting 13 is knotted for increased strength, and to minimise damage to the netting should any of its thread break.
20 This also assists in maintenance, should the net be damaged.

Both the border rope 15 and each inner rope 19, 21, 23 are woven so that they pass over two strands of said net at a time. This tends to occur where two strands intersect (as in strands that equate to a warp and a weft).

The platform 11 is supported from the structure 17 by support ropes in the form of
25 two peripheral ropes 25 extending along opposite longitudinal edges 27 and 29 of the platform 11. The peripheral ropes 25 are secured to the platform 11 by clips in the form of carabinas 31, which are positioned in spaced relation, secured around the border ropes 15. The peripheral ropes 25 are tensioned by TIRFOR™ hand winches 32. The peripheral ropes 25 are free to move within the carabinas
30 31, which aids in deploying and dismantling the platform.

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Additional security for the platform 11 is provided by further support ropes in the form of individual ropes 33, which comprise ratchet tensioning strap with hooks to secure to the border rope 15. The ratchet tensioning is provided by a ratchet winch 35 in each individual rope 33. The individual ropes 33 extend to convenient
5 anchor points 37 of the structure 17. The individual ropes 33 extend from positions located spaced apart from each other, along edges of the platform 11.

As illustrated in figure 3, further support ropes in the form of ratchet tensioning strap 39 can be provided to secure to any of the inner ropes to the structure. In figure 3 the ratchet tensioning strap 39 is secured to the inner rope 19 by way of a
10 hook 41. The use of further support ropes in this manner allows predetermined portions of the platform to be tensioned, for supporting of extra load, such as where equipment is to be supported, or where two or more personnel need to work together.

Referring to figure 4, additional support webbing 43 is illustrated. The support
15 webbing 43 is in use, located under the platform 11, and secured under tension to suitable mounting points, which may be shared with the mounting points for the platform 11, or separate therefrom. In use, the support webbing 43 can provide additional rigidity to the platform 11. The support webbing 43 is formed of 50mm wide nylon strapping 45, woven in a weave spaced 100mm apart to form 100mm
20 x 100mm apertures 47, and stitched at each cross-over 49.

The method may further include provision of additional support ropes, strung under tension, underneath the platform.

The additional support provided by the support webbing 43, or by additional ropes allows the weight of rigid planks or aluminium sections to be carried. This may be
25 desirable where a rigid surface is required for supporting equipment.

Outwardly the platform of the invention may appear similar to a safety net. The use of safety nets is well known and wide spread among many industries. Safety nets that are designed to catch a person or object from falling a great distance are very effective if used in this capacity. However, safety nets cannot be used as

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effective working surfaces, even when tension is applied around the edges, due to the excessive sag under load that the netting exhibits, which makes the netting difficult and unsuitable to move around and work on. This is because the middle of the safety net tends to 'sag' under load, therefore pushing the person on the safety net downwards and towards the centre of the safety net, often away from their desired work area. The problem is due to the fact that traditional safety netting is designed for dynamic loading, which is a short sharp burst of energy such as a person or heavy object falling from height. Safety nets used are not specifically designed for a person and especially not more than one person to conduct work on. If work is conducted upon these nets it is necessary for the worker to remain still and to maintain a low centre of gravity which in most cases means sitting down in the net.

In contrast to the problems associated with attempting to use safety nets as a work surface, the work platform of the invention is able to carry the load of a worker or workers, and their equipment for sustained periods of time. The work platform of the invention can withstand continuous static loading, which means it can hold heavy loads for long periods of time. The platform of the invention can also be slackened off by partially releasing the winches 32 and 33, allowing the platform 11 to be used in a dynamic loading capacity as a fall arrest netting system.

The platform of the invention provides stability and ease of operation for those conducting work upon the netting itself. This is achieved by providing the inner ropes 19, 21, 23, which achieve the same function as the border rope, to create multiple zones within the broad area of the netting. These inner perimeter ropes can be used to apply tension to the surface of the net, as illustrated in figure 3, which makes the platform 11 easier to work on. These extra leverage points reduce the tendency of the netting as a whole to sag when a load is applied. The inner perimeter ropes also allow certain areas of the netting system to be tensioned to individual workers requirements. One worker may have a different preference to another as to what they consider a comfortable and suitable working platform.

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The border rope 15 can also be used to adjust the span of the netting, and the inner ropes can be used in locations in place of the border rope 15, allowing the edge of the platform to conform around obstructions.

5 The use of high density polyethylene provides resistance to water, acid, alkaline and most chemical solvents, and provides high tensile strength meaning it can withstand extreme tension and lateral loading. The high density polyethylene provides fire resistance up to 200°C. Small mesh and high resistance to fire and heat mean jobs such as welding can be conducted without fear of 'slag' damaging the net as the majority of it falls through without ever touching the netting itself.

10 Other advantages of polyethylene are that it is capable of being stretched, and therefore greater tension can be applied to the net if it is polyethylene than if it were some other substance.

15 The platform 11 in this embodiment is rectangular, and is shown extended between external structures 17 comprising more or less parallel walls. It should be appreciated that the platform need not be rectangular, and may be of any desired shape depending upon the situation where it is to be employed. For example, the platform may be constructed in a circular configuration, where it is desired to use it within a cylindrical tank of circular cross-section.

20 In addition, which the rectangular platform is described as secured along peripheral ropes, it will be appreciated that there may be situations where due to proximity of other structures, it is not necessary to use perimeter ropes extending along the longitudinal edges of the platform, and one or both longitudinal edges of the platform may be secured to a structure in similar manner to the ends of the platform, as described above.

25 It should be appreciated that the scope of the invention is not limited to the particular embodiment disclosed herein, and that changes may be made without departing from the spirit and scope of the invention. While throughout the specification and claims that follow, the term "rope" is used, it should be understood that this is not limited to natural or synthetic fibre based material, and

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may include monofilamentateous materials, metal cables, non-round cross-section profile material such as strapping.

The Claims Defining the Invention are as Follows

1. A platform for use as a temporary support structure, said platform comprising an expanse of netting having a border rope fitted thereto around the outer periphery thereof, and at least one inner rope fitted to
5 said netting, extending around, inside and spaced from said border rope, and spaced from any other said at least one inner rope.
2. A platform as claimed in claim 1 wherein said at least one inner rope is spaced evenly from said border rope, in concentric manner.
3. A platform as claimed in claim 1 or 2 wherein said at least one inner rope is
10 spaced evenly from any other said at least one inner periphery rope, in concentric manner.
4. A platform as claimed in any one of the preceding claims wherein said border rope is woven through the mesh of said net.
5. A platform as claimed in any one of the preceding claims wherein said
15 border rope is attached to said netting.
6. A platform as claimed in claim 5 wherein said border rope is attached to said netting by being stitched thereto, at least where said border rope intersects said netting.
7. A platform as claimed in any one of the preceding claims wherein each
20 said at least one inner rope is woven through the mesh of said net.
8. A platform as claimed in any one of the preceding claims wherein each said at least one inner rope is attached to said netting.
9. A platform as claimed in claim 8 wherein each said at least one inner rope
25 is attached to said netting by being stitched thereto, at least where any said at least one inner rope intersects said netting.

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10. A platform as claimed in any one of the preceding claims wherein the border rope has its ends spliced together.
11. A platform as claimed in any one of the preceding claims wherein each said at least one inner rope has its ends spliced together.
- 5 12. A platform as claimed in any one of the preceding claims wherein said net has a square mesh.
13. A platform as claimed in any one of the preceding claims wherein said border rope is woven through the mesh of said net passing over or under two strands of said net at a time.
- 10 14. A platform as claimed in any one of the preceding claims wherein each said at least one inner rope is woven through the mesh of said net passing over two strands of said net at a time.
15. A platform as claimed in any one of the preceding claims wherein the mesh of said net is knotted.
- 15 16. A platform as claimed in any one of the preceding claims wherein said platform includes at least one additional rope fitted to said netting, extending across said netting, intersecting said inner rope(s) and said border rope.
17. A platform as claimed in claim 16 wherein each said additional rope is
20 woven through said netting.
18. A platform as claimed in claim 16 or 17 wherein each said additional rope is attached to said netting.
19. A platform as claimed in any one of claims 16 to 18 wherein said additional ropes are attached to said inner rope(s) and said border rope..

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20. A platform as claimed in claim 19 wherein said additional ropes are attached to said netting by being stitched thereto, at least where said additional ropes intersects said netting.
- 5 21. A method of providing a work platform, said method including supporting a platform as claimed in any one of the preceding claims from support ropes extending from said border rope at the edge of said platform and/or said inner ropes, to convenient anchor points of a structure.
- 10 22. A method as claimed in claim 21 wherein said support ropes comprise two peripheral ropes extending along opposite edges of said platform, and secured to said platform in positions located in spaced relation.
23. A method as claimed in claim 21 or 22 wherein said support ropes include individual ropes extending from positions spaced apart from each other, along edges of said platform.
- 15 24. A method as claimed in any one of claims 21 to 23 wherein said support ropes are secured to said border rope.
25. A method as claimed in any one of claims 21 to 24 wherein said support ropes are secured under tension.
- 20 26. A method as claimed in any one of claims 21 to 25 wherein said support ropes include further support ropes secured to a said at least one inner rope.
27. A method as claimed in any one of claims 21 to 26 further including the provision of additional support ropes, strung underneath the platform.
28. A method as claimed in any one of claims 21 to 27 further including the provision of support webbing is located under the platform.
- 25 29. A platform substantially as herein disclosed with reference to the drawings.