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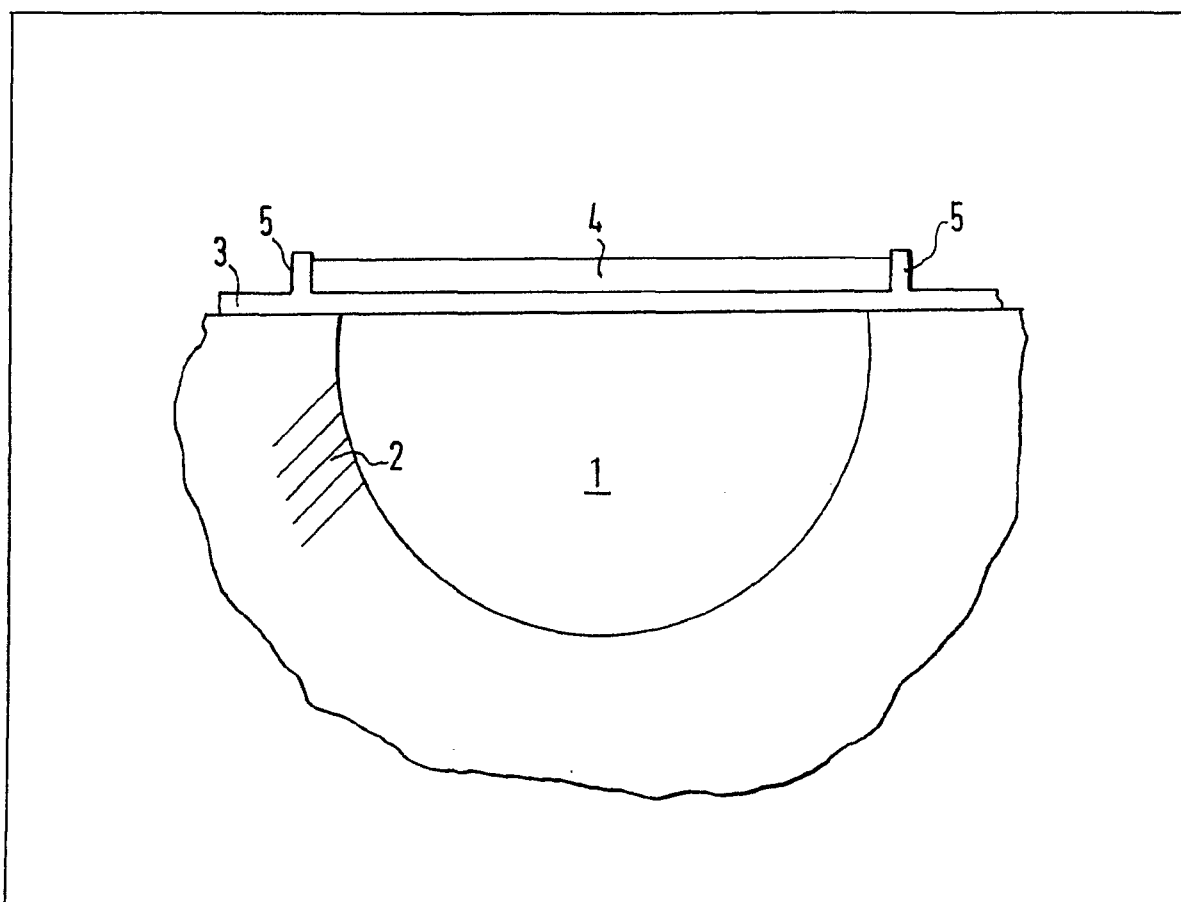
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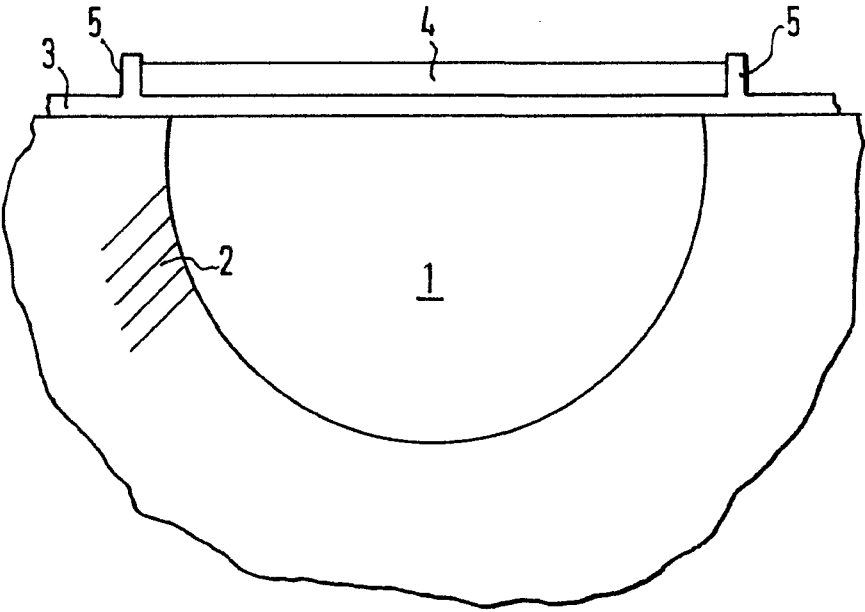
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(54) **Radiation shelter**

(57) A shelter comprises: a cavity (1) for receiving life to be sheltered; a roof (3) for covering at least a portion of said cavity, and at least one aqueous, protective barrier layer (4) adapted to prevent transmission through said roof and into said cavity of at least a portion of radiation in a predetermined spectrum. The cavity walls may be impregnated with an oil suitable for dressing burns.



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SPECIFICATION
Radiation shelter

There is a continuing need for shelters against radiation, especially shelters that can be constructed as quickly as possible before explosion of a nuclear device in the air.

According to the present invention, a shelter comprises: a cavity for receiving life to be sheltered; a roof for covering at least a portion of said cavity, so as to provide cover over said life; and at least one aqueous, protective barrier layer for the so as to prevent transmission through said roof and into said cavity of at least a portion of radiation in a predetermined spectrum.

The cavity can be statically or movably located. Examples of statically located cavities are recesses in earth, rock, or sand, for instance a cavity comprising at least a portion of a bed of: a river, canal, or sluice, or look for a river or canal. Other examples of statically located cavities comprise at least a portion of: a pit, fissure, or trench. Some examples of movably located cavities comprise at least portions of interiors of vehicles, e.g. of barges or other suitable water vehicles, or of a land vehicle, e.g. land vehicles for carrying soldiers. It will be appreciated that any said cavity can be at least partly natural and/or at least partly artificial.

Surface of the cavity can be supported by any suitable means, if required. For instance, wall surface can be consolidated by any suitable consolidation means, e.g. by impregnant, preferably impregnant comprising Tung oil, conveniently Tung oil of a quality for dressing burns.

At least part of the roof can be solid or hollow. If desired, such a hollow can contain at least one said aqueous, protective barrier layer, even if such a layer is provided on the top of the roof. At least part of the roof can be self-supporting or not self-supporting (e.g. a membrane). The roof can be provided in any suitable way, e.g. the roof can be an integral structure or a composite structure. At least part of the roof can be movable and/or adjustable, e.g. the roof can be rollable to expose the interior of the cavity, when that exposure is required. Preferably, the roof is resistant to at least one predetermined temperature, e.g. to the boiling state of at least one said protective barrier layer.

The roof can comprise means for resisting transmission therethrough of at least a portion of said radiation. For instance, the roof can comprise reflection means for reflecting away at least a portion of any incident said radiation, e.g. metallised surface constituting a reflector on the top of the roof. Another instance is when the roof comprises means for absorbing at least a portion of any said incident radiation, e.g. a said barrier layer within the roof (when hollow) and/or e.g. lead particles in that layer or in the material of the roof. Preferably, the roof is rollable. The roof can be made from at least one suitable material, e.g. from plastics materials (conveniently for membrane roofs) comprising at least one of polyethylenes, polypropylenes, polyvinylchlorides, and nylons.

65 Any suitable polymeric material(s) can be used as material(s) for the roof.

At least a portion of at least one said protective barrier layer can comprise running or standing water, provided in any suitable way, e.g. by discharge from any suitable source, for instance water can be pumped from said cavity to the top of the roof. Preferably, a said protective barrier layer contacts the top of the roof. At least one said protective barrier layer can comprise at least one further component in addition to water, e.g. such a component can be radiation-reflecting particles or radiation-absorbing particles.

The shelter can comprise at least one boundary means for defining at least one boundary of at least one said protective barrier layer. For instance, the roof can have at least one upwardly projecting portion therefrom for defining at least one said boundary; or at least one boundary means (e.g. a wall of suitably filled bags) for defining a perimeter around the top of the roof, for instance a perimeter located on or near the edge of the cavity.

It will be appreciated that the roof can be permanently or temporarily secured in position by using any suitable means. Also, the roof can be supported by any suitable means, if appropriate. If desired, at least a portion of such support means can be internal or external of said cavity.

The shelter can be provided with at least one service means, e.g. selected from air conditioning means (e.g. for ventilation), temperature conditioning means (e.g. for providing warmth), sanitation means, and furniture means.

In that the cavity will contain at least one occupancy void for receiving said life, said void can be of any suitable kind, e.g. the void can be provided with an artificial bottom (e.g. duckboards, or a platform). A submersible pump could be provided under such an artificial bottom so as to remove from the cavity any undesirable water, and thereby e.g. pump such water to at least one said aqueous barrier layer.

One embodiment of the invention will now be described by way of example with reference to the accompanying drawing, which is a schematic vertical section through one instance of a shelter according to the present invention.

In the drawing, a natural cavity 1 has its wall and bottom material consolidated by impregnant comprising Tung oil 2, e.g. of quality for dressing burns. The cavity 1 constitutes an occupancy void which can receive at least one person. Above the occupancy void and at the top of the cavity is a rollable roof 3 in the form of e.g. a plastics membrane. The perimeter of the roof is secured by any suitable means (not shown) to the top of the edge of the cavity, e.g. such means can be bags containing earth, sand, or rock. The top of the roof is adapted to bear a water layer 4. Boundary edge of such a layer can be provided in any suitable way, e.g. by means for securing the roof to the top of the edge of the cavity. Such boundary means can comprise at least one upwardly projecting portion 5 integral with the roof. It will be

appreciated that a roof 3 having at least one projection 5 (e.g. to define a rim for the water layer 4) can be easily provided and stored for use.

The shelter shown in the drawing can be realised in accordance with any of the provisions of disclosures given above before the reference to the accompanying drawing.

The present invention extends to equivalents of the above disclosures of the present invention.

Furthermore, the invention includes parts and fittings for the shelter, e.g. a further aspect of the invention is the provision of a roof for use in constructing a shelter according to the present invention.

It will be appreciated that a roof according to the present invention could be provided by means of e.g. a suitably adapted groundsheet or other equipment of a soldier.

CLAIMS

1. A shelter comprises: a cavity for receiving life to be sheltered; a roof for covering at least a portion of said cavity, said roof being adapted to provide cover over said life; and at least one aqueous, protective barrier layer adapted to prevent transmission through said roof and into said cavity of at least a portion of radiation in a predetermined spectrum.

2. A shelter as claimed in claim 1, wherein said cavity is statically located.

3. A shelter as claimed in claim 2, wherein said statically located cavity is a recess in earth, rock, or sand.

4. A shelter as claimed in claim 2 or 3, wherein said statically located cavity comprises at least a portion of: a pit, fissure, or trench.

5. Shelter as claimed in claim 2, wherein said statically located cavity comprises at least a portion of a bed of: a river, canal, or sluice, or lock for a river or canal.

6. A shelter as claimed in claim 1, wherein said cavity is movably located.

7. A shelter as claimed in claim 6, wherein said movably located cavity comprises at least a portion of interior of a vehicle.

8. A shelter as claimed in any one of claims 1 to 7, wherein surface of said cavity is supported.

9. A shelter as claimed in claim 8, wherein wall surface of said cavity is consolidated by consolidation means.

10. A shelter as claimed in claim 9, wherein said consolidation means comprises impregnant.

11. A shelter as claimed in claim 10, wherein said impregnant comprises a Tung oil.

12. A shelter as claimed in any one of claims 1 to 11, wherein at least part of said roof is solid.

13. A shelter as claimed in any one of claims 1 to 12, wherein at least part of said roof is hollow.

14. A shelter as claimed in claim 13, wherein a hollow in said roof contains at least one said

aqueous, protective barrier layer.

15. A shelter as claimed in any one of claims 1 to 14, wherein at least part of said roof is self-supporting.

16. A shelter as claimed in any one of claims 1 to 15, wherein at least part of said roof is not self-supporting.

17. A shelter as claimed in claim 16, wherein at least part of said roof is a membrane ground sheet, or the like.

18. A shelter as claimed in any one of claims 1 to 17, wherein at least part of said roof is movable and/or adjustable.

19. A shelter as claimed in any one of claims 1 to 18, wherein said roof is resistant to at least one predetermined temperature.

20. A shelter as claimed in any one of claims 1 to 19, wherein said roof comprises means for resisting transmission therethrough of at least a portion of said radiation.

21. A shelter as claimed in claim 20, wherein said roof comprises reflection means for reflecting away at least a portion of radiation, and/or means for absorbing at least a portion of radiation.

22. A shelter as claimed in any one of claims 1 to 21, wherein said roof is made from plastics material(s).

23. A shelter as claimed in any one of claims 1 to 22, wherein at least a portion of at least one said barrier layer comprises running water.

24. A shelter as claimed in any one of claims 1 to 23, wherein at least a portion of at least one said barrier layer comprises standing water.

25. A shelter as claimed in any one of claims 1 to 24, wherein a said protective barrier layer contacts the top of said roof or is within said roof.

26. A shelter as claimed in any one of claims 1 to 25, wherein a said protective barrier layer comprises means for reflecting away at least a portion of radiation and/or means for absorbing at least a portion of radiation.

27. A shelter as claimed in any one of claims 1 to 26, comprising at least one boundary means for defining at least one boundary of at least one said barrier layer.

28. A shelter as claimed in any one of claims 1 to 27, comprising securing means for securing said roof in any position.

29. A shelter as claimed in any one of claims 1 to 28, comprising support means for supporting said roof.

30. A shelter as claimed in any one of claims 1 to 29, comprising at least one service means.

31. A shelter as claimed in claim 1, substantially as hereinbefore described with reference to and as shown in the accompanying drawing.

32. A roof for a shelter as claimed in any one of claims 1 to 31.