CLAIMS

1. A lightweight protection element and filter of the mattress type comprising an external containment structure (10, 20), a three-dimensional internal structure (30) with a high cavity index, a granular filler material which is inserted inside the containment structure and engagement means (50, 52, 56) which are distributed over the external containment structure in order to engage predetermined portions of that external structure with each other.

2. An element according to claim 1, characterized in that the external containment structure comprises a lower portion (10) and an upper portion (20), the engagement means (50, 52, 56) engaging the lower portion (10) with the upper portion (20).

3. An element according to claim 2, characterized in that the engagement means comprise mechanical engagement means (50, 52, 56).

4. An element according to claim 3, characterized in that the mechanical engagement means comprise at least a pair of plates (50), at least a fixing bar (52) and at least a pair of blocks (56) which can selectively be engaged with the ends (54) of those fixing bars (52).

5. An element according to claim 4, characterized in that the ends of the external containment structure are fixed to each other so as to close the protection element and filter and to retain inside it the three-dimensional structure with a high cavity index and the filler material.

6. An element according to claim 1, characterized in that the three-dimensional internal structure (30) with a high

cavity index comprises a non-woven goetextile and/or monofilaments of heat-sensitive material.

7. An element according to claim 2, characterized in that the lower portion (10) and the upper portion (20) of the external containment structure are constructed from at least one of the following synthetic materials: woven geotextiles, woven geogrilles, geomembranes, geonets.

8. An element according to claim 2, characterized in that the lower portion (10) and the upper portion (20) of the external containment structure are constructed from at least one of the following natural materials: reed matting, biodegradable bionet, straw, coconut fibre, wood shavings.

9. An element according to any one of the preceding claims, characterized in that it further comprises a reinforcement element (48) in order to increase, during use, the resistance to traction of the whole element.

CLAIMS

1. A lightweight filtering mattress for protecting and covering terrains, comprising an external containment structure having one or more sheets of material which define an internal space; a three-dimensional internal structure with a high cavity index comprised of non-woven geotextile disposed throughout the internal space; a granular filler material inside the three-dimensional internal structure, the granular filler material disposed to assist the three-dimensional internal structure in the filtering action and to maintain the thickness of the three-dimensional internal structure under load; and engagement means distributed over the external containment structure in order to engage predetermined portions of the external containment structure with each other.

2. The mattress according to claim 1, wherein the external containment structure comprises a lower portion and an upper portion, the engagement means engaging the lower portion with the upper portion.

3. The mattress according to claim 2, wherein the engagement means comprises mechanical engagement means.

4. The mattress according to claim 3, wherein the mechanical engagement means comprises at least a pair of plates, at least one fixing bar, and at least a pair of blocks which can selectively be engaged with ends of the fixing bar.

5. The mattress according to claim 4, wherein the external containment structure has ends which are fixed to each other so as to close the mattress, and to retain the three-dimensional internal structure with a high cavity index and the filler material.

6. The mattress according to claim 2, wherein the lower portion and the upper portion of the external containment structure are constructed from at least one of the following synthetic materials: woven geotextiles, woven geogrilles, geomembranes, geonets.

7. The mattress according to claim 2, wherein the lower portion and the upper portion of the external containment structure are constructed from at least one of the following natural materials: reed matting, biodegradable bionet, straw, coconut fibre, wood shavings.

8. The mattress according to claim 1, wherein the three-dimensional internal structure with a high cavity index comprises monofilaments of heat-sensitive material.

9. The mattress according to claim 1, and further comprising a reinforcement element in order to increase, during use, the resistance to traction of the mattress.

10. A lightweight protection element comprising: a containment structure comprising a bottom sheet and an upper portion disposed above the bottom sheet, the bottom sheet and upper portion being disposed to define a space therebetween, the bottom sheet and the upper portion being constructed from at least one of the following synthetic materials: woven geotextiles, woven geogrilles, geomembranes, and geonets; a plurality of engagers each comprising members on the bottom sheet and upper portion and engaging predetermined portions of the containment structure with each other; a three-dimensional internal structure with a high cavity index disposed throughout the space in the containment structure and comprising monofilaments of heat-sensitive material distributed throughout the space within the containment structure, wherein the engagers are distributed over the entire extent of the bottom sheet and upper portion and extend through the three-dimensional internal structure between the bottom sheet and the upper portion so as to fix same to each other and stabilize the element; and granular filler material in the space within the containment structure, wherein ends of the bottom sheet and the upper portion are fixed to each other so as to close the element and retain inside it the three-dimensional structure.

11. The element according to claim 10, wherein each engager comprises two opposing plates, a fixing bar attached to the plates and having a first end and a second end, and a first block attached to the first end of the fixing bar and a second block attached to the second end of the fixing bar.