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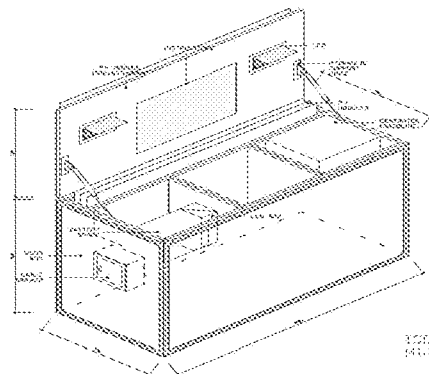
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Mobile Modular Emergency system.

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The invention relates to a mobile modular emergency system comprising : -a power generation module 1 configured to generate and store electrical power, comprising at least one power generation unit coupled with a power storage unit; -a water purification module 2 configured to pump water from a water source, decontaminate the pumped water, store temporarily said water, and distribute said purified water to a distribution medium, the water purification module 2 comprising a water pump, a seven stages reverse osmosis water filter unit, a water tank, and a water distribution unit; -an emergency communication module 3 configured to enable low latency high speed internet satellite connection and geolocation, comprising a geolocation unit, an Internet reception unit integrating an antenna communicatively coupled with a router, said router configured for high speed low latency satellite internet connection; all modules integrated in a compact mobile box-like structure.

[Fig. 1]



Specification

LU504635

Mobile Modular Emergency system

Field of technology

1. The disclosure relates generally to emergency implementation technologies, and more specifically to a mobile Modular emergency system allowing deployment in emergency areas where no power supply, drinkable water or telecommunication are available.

State of the art

2. In areas where no power supply, drinkable water or telecommunication are available such as mountains, war zones, deserts, or in the aftermath of natural phenomenon's such as but not limited to earthquakes, hurricanes, tornados, the emergency personnel can't count on power, water, nor standard communication to effectively provide emergency services.
3. Water filtration systems are well known for their use in remote areas but are usually dependent on the continuous supply of electrical power which may fail to provide due to the lack of electricity producing means or combustible material feeding said producing means. Consequently, it results in variability in the quality and quantity of the purified water produced and can strongly hinder the emergency services efforts or provide sustainable fresh water in the area of operation.
4. Emergency communication system and broadcast are usually specialised and expensive equipment which are usually limited to voice and text messages, which limits the efficacy of any deployment of emergency services and provide limited data to coordinate an operation in real-time.
5. Emergency power supply are usually in the form of batteries or fuel generators which are either heavy, unreliable or dependent of fuel which may be limited in supply on site of any area of operation.
6. Finally, emergency services usually rely on med packs comprising portable and long shelf pharmaceuticals drugs and supplies specially adapted to any field operation but don't provide specialised medicine or supply due to a lack of

refrigerated container to insure efficacy and risks. The lack of refrigeration means usually come to pair with the lack of a sustainable power supply to power said refrigeration means.

7. The invention remedies those limitations.

Summary of the invention

8. The invention relates to a Mobile Modular Emergency system comprising :
 - a power generation module configured to generate and store electrical power, comprising at least two power generation units configured to work alternatively, coupled with a power storage unit;
 - a water purification module configured to pump water from a water source, decontaminate the pumped water, store temporarily said water, and distribute said purified water to a distribution medium, the water purification module 2 comprising a water pump, a seven stages reverse osmosis water filter unit, a water tank, and a water distribution unit;
 - an emergency communication module configured to enable low latency high speed internet satellite connection and geolocation, comprising a geolocation unit, an Internet reception unit integrating an antenna communicatively coupled with a router, said router configured for high speed low latency satellite internet connection;
 - all modules integrated in a compact mobile box-like structure.
9. Advantageously, the system according to the invention provide a self-sufficient power production able to provide a continuous and sustainable power output supplying a steady purified water production, high speed and low latency internet satellite access, a refrigerated volume to store temperature sensible objects, and overall portable and deployable power supply for external devices and uses.
10. According to one illustrative embodiment, the system an additional refrigeration module, configured to maintain a specified closed volume at a chosen temperature, integrating a monoblock refrigeration unit.
11. According to another illustrative embodiment, the power generation unit is at least one of removable photovoltaic panels, and at least a generator.
12. This allows the system to supply photovoltaic power to charge the battery during solar hours of the day while generating combustion-based electricity with the

generator while no solar exposure is available, this alternating power sources allowing sustainable and continuous power supply to the system limiting the risk of complete failure of the system by providing a switching power supply redundancy.

13. According to the invention, the power generation module comprises a DMS central unit configured to control and managed each module functions and state of operation, each module comprising a control unit coupled with the power generation module DMS central unit.
14. Said embodiment allows the system to control, monitor and alert for maintenance each module of the system to prevent avoidable module failure.
15. In another embodiment, the box-like structure of the system according to the invention comprises a lid integrating LED lighting devices, allowing lighting in the area of operation to increase visibility.

Brief description of the drawings:

16. **[Fig 1]** is a three-dimensional representation of the system according to the invention ;
17. **[Fig 2]** is a front and side view of the system according to the invention ;
18. **[Fig 3]** is a top view of the system according to the invention ;
19. **[Fig 4]** is a pictural representation of the modules of the system according to the invention ; and
20. **[Fig 5]** is a pictural representation of the system's water purification module 2 various implementation.

Detailed description

21. In reference to figures 1 to 6, the present invention is a mobile Modular emergency system comprising a power generation module 1, a water purification module 2, and an emergency communication module 3.
22. According to figure 1, the system according to the invention described herein comprising a compact mobile box-like structure integrating at least a power generation module 1, a water purification module 2, and an emergency communication module 3.

23. Said box-like structure is made in a low weight durable material such as **marine plywood** and shaped to be compatible with traditional mechanical ways of transportation, and easily deployable in various locations.
24. The box like structure according to the invention comprise an inner box with multiple compartments which allow to host several modules and units.
25. The box-like structure comprises a lid with hydraulic support hinges able to maintain said lid in an open position.
26. In one embodiment, the lid comprises LED lighting devices 5 on one side and temporary fastening means on the outer surface.
27. The power generation module 1 comprises at least two power generation units 11 configured to work alternatively, coupled with a power storage unit 12, configured to generate and store electrical power in a way that each power generation unit 11 functions alternatively in order to provide a continuous supply of electrical power while creating a redundancy mechanism allowing on the other power generation unit 11 to act as a backup power generator and activate if and when the other power generation unit 11 is failing.
28. In one embodiment, one power generation unit 11 is at least one removable photovoltaic panel 111, and the other power generation unit 11 is at least one generator 112.
29. In one embodiment, the removable photovoltaic panel 111 is a flexible light weight photovoltaic panel with limited braking potential. The photovoltaic panels 111 charge, during the sun hours, a power storage unit and the generator charge the power storage unit 12 during hours when the sun exposition is minimal to nonexistent, alternatively charging the power storage unit 12 to provide steady electrical power supply. Said photovoltaic panels 111 are deployed on at least one surface of the box-like structure in combination with the temporary fastening means. The temporary fastening of the photovoltaic panels 111 allows the photovoltaic panel 111 to have an extendable surface using one or more side of the box-like structure as support for electric power generation.
30. In a non-operational storage state of the system, an inner box compartment in the box-like structure allows to host one or more removable photovoltaic panels 111.

31. The power generation unit 11 consisting of a generator 112 may be a fuel-based generator.
32. In one embodiment, the generator is a compact lightweight generator, capable of charging the battery at any time and provides power to the system in case light conditions are unfavourable for the photovoltaic panels 111.
33. In another embodiment, the power storage unit 12 is a smart battery 121, which includes an inverter 123 to supply alternative current to AC devices.
34. In addition, the power generation module 1 comprises a DMS central unit 122 (Device Management System) configured to control and managed each module functions and communicatively coupled with control units 13 integrated in each module of the system.
35. The smart Battery 121 acting as a DMS central unit 122, allows devices to work in AC regime and be used accordingly. The power storage unit 12 may include an inverter 123, manages all the components/modules of the system, and is linked to a DAS (Device Automation System).
36. The DAS supports overall functionality, keeping all specified ranges, controls and monitors performances and module failures, provides malfunction alarms to remote maintenance staff, controls and synchronises the power generation units, while optimising the storage and usage of electrical energy in the power storage unit 12.
37. In one embodiment, the power generation module 1 comprises a cable drawer which allows plugging and extension cable 15 to power external devices. Said cable drawer can be extendable.
38. Additionally, the power generation module 1 may comprise a Multi Charging Station 14, for several kinds of basic devices: mobiles, laptops, basic cooking and others.
39. The system according to the invention further comprises a water purification module 2 configured to pump water from a water source, decontaminate the pumped water, store temporarily said water, and distribute said purified water to a distribution medium.

40. According to figure 5, the water purification module 2 comprises a water pump 21, seven stages reverse osmosis water filter unit 23, a water tank, and a water distribution unit 22.
41. In one embodiment, the water purification module 2 comprises a water pump, that may provide at least 3 bar of pressure, which allows the collection and redirection of water to the water distribution unit 22.
42. In one particular configuration, the distribution unit 22 may be connected to a fire hose, the water purification module 2 acting as fire extinguishing medium.
43. In another embodiment, the water purification module 2 is designed to purify water from various sources and may comprise tap water or rainwater as examples, using a seven stages reverse osmosis water filter unit 23 consisting in a multilevel (up to 7) levels of drainage and purification, including a UV light sanitation sub-unit to kill bacteria.
44. Additionally, the water purification module 2 has an extendable and retractable connection, able to cover a wide radius of water access sources.
45. The water purification module 2 comprises a control unit 13 coupled with the power generation module 1 DMS central unit.
46. The system according to the invention further comprises an emergency communication module 3 configured to enable low latency high speed internet satellite connection and geolocation.
47. The emergency communication module 3 comprises a geolocation GPS unit 33, and an Internet reception unit.
48. In one embodiment, the Internet reception unit integrates an antenna 31 communicatively coupled with a router 32, said router 32 being configured for high-speed low latency satellite internet connection.
49. High speed is defined as an upload rate between 15 and 50 Megaoctet per second, download rate between 100 and 300 Megaoctet per second and low latency a latency below 40 millisecond. Those data may vary depending on weather conditions.

50. In one particular embodiment, the emergency communication module 3 allows remote diagnosis of all components/modules and enables prediction of any recharge or repair beforehand.
51. The emergency communication module 3 comprises a control unit 13 coupled with the power generation module 1 DMS central unit 122.
52. In one embodiment, the system according to the invention comprises an additional refrigeration module 4 configured to maintain a specified closed volume at a chosen temperature, which allows to keep medicines, basic medical, non-medical and first aid material at defined temperatures. The refrigeration module 4 comprises a control unit 13 coupled with the power generation module 1 DMS central unit.
53. As an example, the refrigeration module 4 may comprise a monobloc refrigeration unit.
54. The system according to the invention therefore provide a multifunctional compact system, capable to provide energy, light, water purification and connectivity to people in critical zones with needs for power and coverage of basics services and covers daily basic needs in emergency and non-emergency situations such as leisure usage.
55. Furthermore, the system according to the invention is transportable, stackable, expandable, modular, and can be manufactured in high volume.

Claims

1. Mobile Modular Emergency system comprising :
 - a power generation module 1 configured to generate and store electrical power, comprising at least two power generation units configured to work alternatively, coupled with a power storage unit;
 - a water purification module 2 configured to pump water from a water source, decontaminate the pumped water, store temporarily said water, and distribute said purified water to a distribution medium, the water purification module 2 comprising a water pump, a seven stages reverse osmosis water filter unit, a water tank, and a water distribution unit;
 - an emergency communication module 3 configured to enable low latency high speed internet satellite connection and geolocation, comprising a geolocation unit, an Internet reception unit integrating an antenna communicatively coupled with a router, said router configured for high speed low latency satellite internet connection;
 - all modules integrated in a compact mobile box-like structure.
2. Mobile Modular Emergency device according to claim 1, wherein an additional refrigeration module 4 is integrated, and configured to maintain a specified closed volume at a chosen temperature, integrating a monobloc refrigeration unit.
3. Mobile Modular Emergency device according to claim 1 or 2, wherein the power generation unit is at least one of removable photovoltaic panels, and at least a generator.
4. Mobile Modular Emergency device according to claim 1 to 3, wherein the power generation module 1 comprises a DMS central unit configured to control and managed each module functions.
5. Mobile Modular Emergency device according to claim 1 to 4, wherein each module comprising a control unit coupled with the power generation module 1 DMS central unit.
6. Mobile Modular Emergency device according to claim 1 to 5, wherein the box-like structure comprises a lid integrating LED lighting devices.

[Revendication 1]. Système d'urgence modulaire mobile comprenant :

- un module de génération d'énergie 1 configuré pour générer et stocker de l'énergie électrique, comprenant au moins deux unités de génération d'énergie configurées pour fonctionner alternativement, couplées à une unité de stockage d'énergie ;
- un module de purification de l'eau 2 configuré pour pomper de l'eau à partir d'une source d'eau, décontaminer l'eau pompée, stocker temporairement cette eau et distribuer cette eau purifiée à un support de distribution, le module de purification de l'eau 2 comprenant une pompe à eau, une unité de filtrage de l'eau par osmose inverse à sept étapes, un réservoir d'eau et une unité de distribution de l'eau ;
- un module de communication d'urgence 3 configuré pour permettre une connexion Internet par satellite à haut débit et à faible latence et la géolocalisation, comprenant une unité de géolocalisation, une unité de réception Internet intégrant une antenne couplée de manière communicative avec un routeur, ledit routeur étant configuré pour une connexion Internet par satellite à haut débit et à faible latence ;

tous les modules sont intégrés dans une structure compacte et mobile de type boîte.

[Revendication 2]. Dispositif d'urgence mobile modulaire selon la revendication 1, dans lequel un module de réfrigération supplémentaire 4 est intégré, et configuré pour maintenir un volume fermé spécifié à une température choisie, intégrant une unité de réfrigération monobloc.

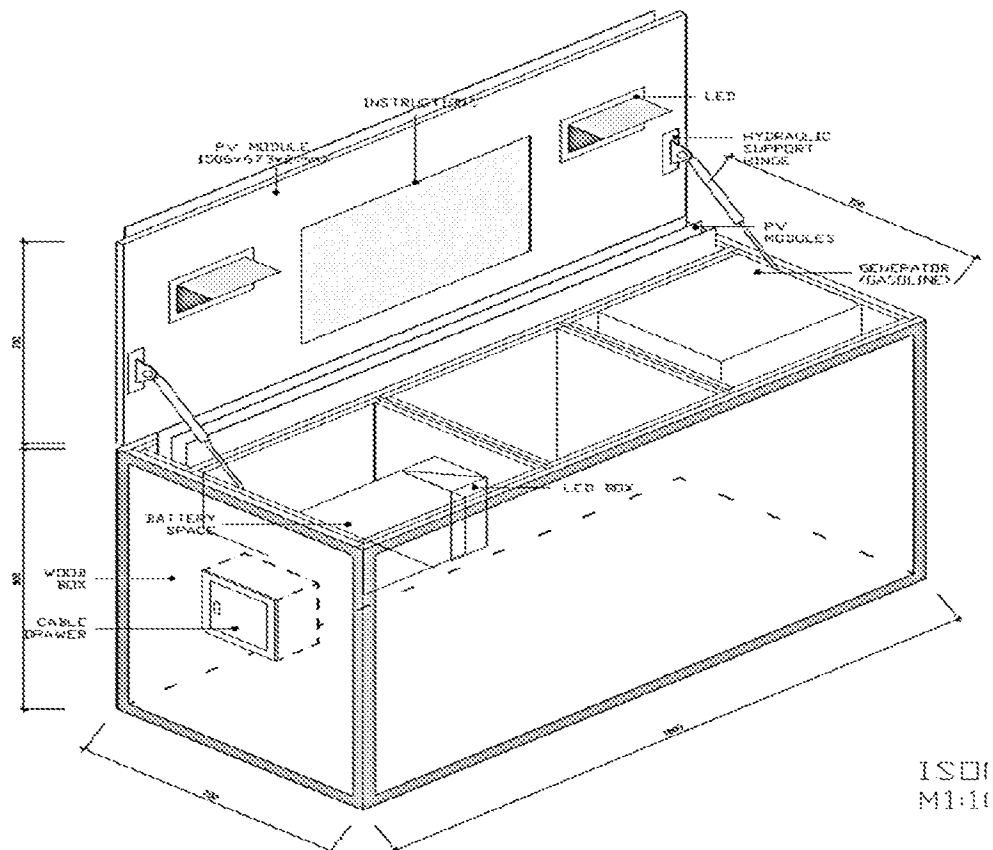
[Revendication 3]. Dispositif mobile modulaire d'urgence selon la revendication 1 ou 2, dans lequel l'unité de production d'énergie est au moins l'un des panneaux photovoltaïques amovibles et au moins un générateur.

[Revendication 4]. Dispositif d'urgence mobile modulaire selon les revendications 1 à 4, dans lequel chaque module comprend une unité de commande couplée à l'unité centrale du module de production d'énergie 1 DMS.

[Revendication 5]. Dispositif mobile modulaire d'urgence selon la revendication 1 à 5, dans lequel la structure en forme de boîte comprend un couvercle intégrant des dispositifs d'éclairage à DEL.

Figures

[Fig. 1]



Technical drawing of a mobile cart with two shelves, showing side and front views with dimensions and labels.

Labels:

- PV MOBILE CONSTRUCTION
- HEAVY DUTY RIGID PV STRUCTURE
- WHEEL STOP PROTECTOR
- PV MOBILE CONSTRUCTION
- POLYURETHAN COATING
- HYDRAULIC SUPPORT ARM
- CABLE GRAPPLE
- WHEEL STOP PROTECTOR
- PV MOBILE CONSTRUCTION
- WHEEL STOP PROTECTOR

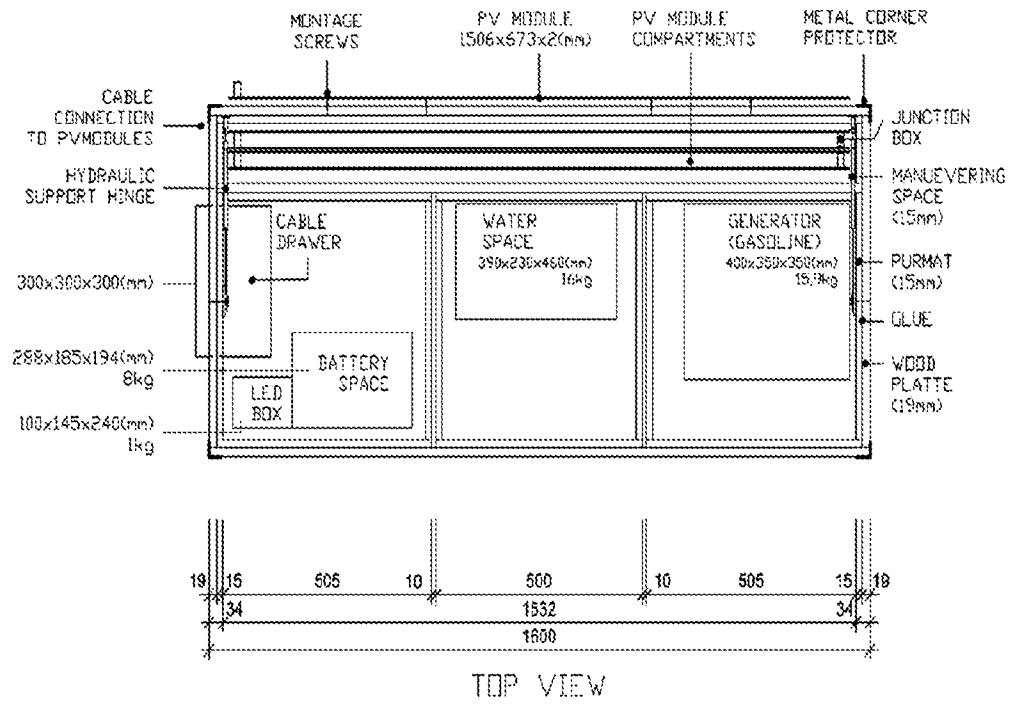
Dimensions:

- Overall height: 2100
- Overall width: 1500
- Overall depth: 800
- Shelf height: 1000
- Shelf width: 1400
- Shelf depth: 700
- Cart width: 800
- Cart depth: 1500
- Shelf depth: 700
- Shelf width: 1400
- Shelf height: 1000
- Overall height: 2100
- Overall width: 1500
- Overall depth: 800
- Shelf height: 1000
- Shelf width: 1400
- Shelf depth: 700
- Cart width: 800
- Cart depth: 1500
- Shelf depth: 700
- Shelf width: 1400
- Shelf height: 1000

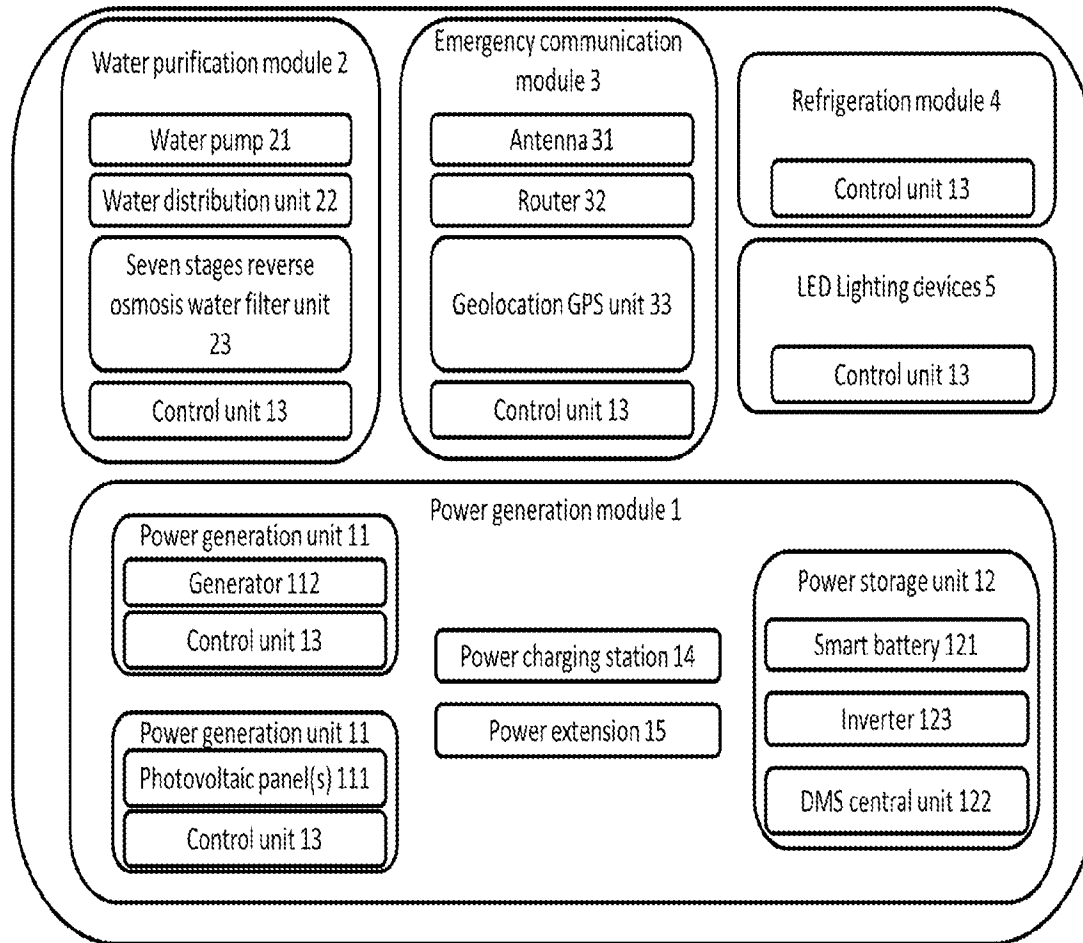
Views:

- SIDE VIEW
- FRONT VIEW
- SIDE VIEW

[Fig. 3]



[Fig. 4]



[Fig. 5]

