DEPLOYABLE STRUCTURE SHIELD

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ABSTRACT

A readily deployable shield for single family dwellings and other structures protects the structures from transient, temporary threats such as fire, hurricane, tornado or similar forces. The deployable structure shield is delivered to a structure site in an enclosed shield module. The enclosed shield module may be permanently or temporarily secured to the roof of the structure to be protected. The shield module includes the shield canopy, an energy generator, a compressor, control electronics, one or more deployment catapults, sandbags, lanyards, tie-down straps, and a manual deployment apparatus. Once secured to the roof of a structure, the shield canopy may be deployed manually with the manual deployment apparatus, or remotely using the control electronics and any suitable initiation apparatus such as a smartphone.
DEPLOYABLE STRUCTURE SHIELD

RELATED APPLICATIONS

This application claims priority to a pending U.S. Provisional patent application 61/653,094 filed on May 30, 2012.

FIELD OF THE INVENTIONS

The inventions described below relate to the field of structure protection and more specifically to the field of deployable shields for the protection of structures from temporary threats such as hurricane, tornado and or fire.

BACKGROUND OF THE INVENTIONS

Temporary covers for structures such as tents for covering houses have been used for various applications such as termite fumigation and asbestos abatement.

SUMMARY

The devices and methods described below provide a readily deployable structure shield for single family dwellings and other structures to protect the structures from transient, temporary threats such as fire, hurricane, tornado or similar forces. The deployable structure shield is delivered to a structure site in an enclosed shield module. The enclosed shield module may be permanently or temporarily secured to the roof of the structure to be protected. The shield module includes the shield canopy, an energy generator, a compressor, control electronics, one or more deployment catapults, sandbags, guyards, tie-down straps, and a manual deployment apparatus. Once secured to the roof of the structure, the shield canopy may be deployed manually with the manual deployment apparatus, or remotely using the control electronics and any suitable initiation apparatus such as a smartphone.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of a shield module secured to the roof of a structure.
FIG. 2 is a top view of a shield module showing the contents.
FIG. 3 is a perspective view of a fully deployed structure shield.
FIG. 4 is a cross-section view of the shield module of FIG. 1.
FIG. 5 is a close-up view of the securing mechanism of the canopy to the shield module.
FIG. 6 is a perspective view of a deployment catapult within a shield module.
FIG. 7 is a view of the tie down details of a canopy corner.
FIG. 8 is a view of an alternate tie down detail of a canopy corner.
FIG. 9 is a side view of the canopy and tie-down secured to an anchor.
FIG. 10 is a perspective view of an alternate shield module configuration.
FIG. 11 is a side view of the shield module of FIG. 10.
FIG. 12 is a perspective view of the shield module of FIG. 10 with two module doors removed and one module door opened.

DETAILED DESCRIPTION OF THE INVENTIONS

FIG. 1 is a side view of a shield module secured to the roof of a structure.

FIG. 2 is a top view of a shield module showing the contents.
FIG. 3 is a perspective view of a fully deployed structure shield.
FIG. 4 is a cross-section view of the shield module of FIG. 1.
FIG. 5 is a close-up view of the securing mechanism of the canopy to the shield module.
FIG. 6 is a perspective view of a deployment catapult within a shield module.
FIG. 7 is a view of the tie down details of a canopy corner.
FIG. 8 is a view of an alternate tie down detail of a canopy corner.
FIG. 9 is a side view of the canopy and tie-down secured to an anchor.
FIG. 10 is a perspective view of an alternate shield module configuration.
FIG. 11 is a side view of the shield module of FIG. 10.
FIG. 12 is a perspective view of the shield module of FIG. 10 with two module doors removed and one module door opened.
secured to anchor 52C, strap 17B is secured to anchor 52A, strap 17C is secured to anchor 52D and strap 17D is secured to anchor 52B.

[0023] Referring now to FIG. 9, upon deployment of canopy 11, straps such as strap 17B are secured to anchors such as anchor 52A. Straps 17 may adapt any suitable technique for tightening and securing such as buckles, ratchets and or hook and loop facets.

[0024] Shield module 40 is configured as illustrated in FIGS. 10 and 11 with skids 41 and 42 oriented for accommodating a roof peak 3 between the skids as shown. Doors 43A, 43B, 43C, 43D, 43E, 43F, 43G and 43H have at least two panels such as side panel 44 and top panel 45 of door 43B. Control module 46 may adopt any suitable configuration such as illustrated. Monitor mast 46A provides weather information and may also provide antenna services for sending and receiving information pertinent to a decision to open the doors and deploy the shield canopy.

[0025] In FIG. 12, shield module 40 is illustrated with door 43B opened and doors 43A and 43C removed to expose canopy storage space 47. A shield canopy such as canopy 11 may be folded and arranged within storage space 47. Deployment or opening of the doors creates an extended platform from door panels such as panels 44 and 45 as shown.

[0026] In use, a structure shield such as shield module 40 is located or secured to the roof of a structure such as structure 1 of FIG. 1. In the event of an emergency, control module 16 initiates opening of the module doors such as door 10 to permit deployment of shield canopy 11. The shield deployment mechanisms are then activated to extend deployment lines to the ground around structure 1. Deployment lines are used to pull the perimeter of shield canopy 11 beyond the edges of the roof of the structure. Canopy straps such as straps 17A and 17B are used to secure the canopy to anchors such as anchor 25A secured in the ground around the structure. For non-inflatable shield canopies, securing the straps to the anchors completes enveloping and shielding the structure. Upon securing, or just prior to securing all the straps to anchors, control module may begin inflating shield canopy if the canopy is inflatable. Inflation of the shield canopy completes envelopment and shielding of structure 1 for inflatable shield canopies.

[0027] While the preferred embodiments of the devices and methods have been described in reference to the environment in which they were developed, they are merely illustrative of the principles of the inventions. The elements of the various embodiments may be incorporated into each of the other species to obtain the benefits of those elements in combination with such other species, and the various beneficial features may be employed in embodiments alone or in combination with each other. Other embodiments and configurations may be devised without departing from the spirit of the inventions and the scope of the appended claims.

We claim:
1. A structure shield for enclosing and shielding a structure with a perimeter comprising:
   a shield module having a plurality of doors enclosing a storage space;
   a shield canopy secured to the shield module, the shield canopy having a perimeter, and sized to enclose the structure, the shield canopy folds to be stored within the storage space;
   a plurality of deployment lines and securing straps attached to the perimeter of the shield canopy;
   one or more means for deployment, the means for deployment projecting the deployment lines beyond the perimeter of the structure; and
   a control module to monitor and deploy the shield canopy automatically.

2. The structure shield of claim 1 wherein the shield canopy is inflatable and the control module includes a suitable mechanism to inflate the shield canopy and controls inflation of the shield canopy.

3. A method for enclosing and shielding a roofed structure comprising the steps:
   locating a shield module on the roof of the structure, the shield module having a plurality of doors enclosing a storage space with a shield canopy and a control module within;
   opening the doors of the shield module;
   extending a plurality of deployment lines connected to the shield canopy over the roof of the structure to extend to the ground;
   using the deployment lines to extend the shield canopy to enclose the structure;
   securing a plurality of securing straps to anchors surrounding the structure to secure the shield canopy around the structure.

4. The method of claim 4 further comprising the step: inflating the shield canopy during the securing step.

5. The method of claim 4 further comprising the step: inflating the shield canopy following the securing step.

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