ABSTRACT

A fire and heat resistant storage unit for housing electronic media includes a core body portion of heat resistant material surrounded by an outer shell. An opening in a bottom wall of the outer shell allows a user access to a housing unit that is placed in the core body portion. A locking cap seals off the opening in the outer shell and a handle attached to the outer shell aids a user in flipping the storage unit from an access position in which a user can access the housing, to a storage or in-use position in which the bottom wall is directly adjacent a relatively planar support surface. Such a configuration significantly increases the fire and heat resistance of the storage unit and allows electronic media to be stored safely without being damaged.
PORTABLE FIRE AND HEAT RESISTANT STORAGE UNIT FOR ELECTRONIC MEDIA

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

The present invention pertains to the art of fire and heat resistant enclosures and, more specifically, to a portable storage unit for storing and protecting electronic media such as CDs and DVDs from exposure to fire and high temperatures.

[0002] 2. Discussion of the Prior Art

There is a long-standing need to protect valuable items, including business records, from high temperatures, particularly those experienced during a fire. With the advent of computers, important business documents are stored on electronic data storage media, such as compact disks (CDs), digital video disks (DVDs) or magnetic tapes. These electronic media records are subject to damage at lower temperatures than traditional paper records. In order to protect such records, many businesses will periodically transport their electronic media records to highly fire/heat-resistant bank vaults for safekeeping. Of course, storing the electronic media in a fire and heat resistant container on-site would be less costly and less time-consuming for most businesses.


Various types of heat and fire resistant containers have been used in the past to store valuables, including containers having multiple layers of fire/heat-proofing materials, such as the container described in U.S. Pat. No. 4,735,155. However, the materials and methods of manufacturing needed to produce such multi-layered containers can be costly. Other containers, such as the one disclosed in U.S. Pat. No. 3,855,741, have a solid main body covered with a shell. These containers can be heavy and can have limited heat-proofing capabilities. Based on the above, there exists a need in the art for a portable heat resistant storage container that is simple to manufacture and has a high enough heat resistance rating to store electronic media safely.

SUMMARY OF THE INVENTION

The present invention is directed to a portable and heat resistant storage unit for the storage of electronic media, particularly CDs and DVDs. The storage unit comprises a core body portion of calcium silicate encased in a shell. A locking cap is attached to a bottom wall portion of the shell and allows a user to access a housing in which electronic media, such as CDs or DVDs, can be stored. A handle is attached to the storage unit to aid a user in flipping the storage unit from an access position, in which the user can access the electronic media housing, to a storage or in-use position in which the bottom wall portion is arranged directly adjacent a relatively planar supporting surface, such as a concrete floor. With the bottom wall portion of the storage unit adjacent the relatively planar supporting surface, little air and, correspondingly, minimal oxygen, is available beneath the storage unit. This results in a highly heat resistant storage unit that allows for the safe storage of heat sensitive electronic media.

[0004] Additional objects, features and advantages of the present invention will become more readily apparent from the following detailed description of a preferred embodiment when taken in conjunction with the drawings wherein like reference numerals refer to corresponding parts in the several views.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is an exploded perspective view of one preferred embodiment of the heat resistant storage unit of the present invention shown inverted;

[0009] FIG. 2 is a cross-sectional view of the heat resistant storage unit of FIG. 1; and

[0010] FIG. 3 is a partially cut-away perspective view of an alternative embodiment of the heat resistant storage unit of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0011] With initial reference to FIGS. 1 and 2, a fire and heat resistant storage unit 10 (hereinafter storage unit 10) includes a core body portion 15; an insert or housing 20; an outer shell 22 comprising a casing 25, a top wall 30, and a bottom wall 35, and a cap 40. In the embodiment shown in FIG. 1, storage unit 10 takes the general form of a cube. Body portion 15 is formed from fire and heat resistant material and includes side portions 45-48, a top portion 49 and a bottom portion 50 having a storage cavity 55, a first rim 57 and a second rim 58 formed substantially centrally therein. Diametrically opposed pin holes 59 are formed within body 15 adjacent second rim 58. Outer shell 22 is preferably formed from sheet steel, but could be formed from other heat resistant materials, including heat resistant plastic. Casing 25 of outer shell 22 extends around body portion 15 and includes side wall portions 65-68. Housing 20, which is preferably formed from plastic, includes a main body portion 70, a stepped portion 71, a bottom portion 72 and a lip portion 75 that extends about an access opening 77. Diametrically opposed pin holes 78 are formed within stepped portion 71 of housing 20. Together, main body portion 70, stepped portion 71 and bottom portion 72 define a housing 20 in which electronic media, such as CDs or DVDs, can be stored. The plastic used to form housing 20 is preferably a standard fire resistant plastic. The region of body portion 15 located between the storage cavity 55 and outer shell 22 defines a buffer zone 80 which protects items located within housing 20 from fire and heat.

[0012] The preferred method of forming storage unit 10 will now be discussed with reference to FIGS. 1 and 2. Preferably, body portion 15 is formed of molded calcium silicate, vermiculite or perlite. Of course, body portion 15 could be formed from any equivalent fire/heat resistant material. In the present embodiment, body portion 15 also includes various additives and fillers, such as cellulose fiber and fiberglass. Storage cavity 55 is then bored into the center of bottom portion 50 of body portion 15 in a manner which establishes a first rim 57 and a second rim 58. Certainly, body portion 15 can be initially formed to include storage cavity 55, such as through a molding or other forming process. Although storage cavity 55 is depicted as substantially cylindrical in FIG. 1, it is understood that any desired shape could be used for storage cavity 55. Of course, first and second rims 57 and 58 would take a shape corresponding to the shape of storage cavity 55. At this point, housing
20 is inserted into storage cavity 55. Preferably, housing 20 fits snugly within storage cavity 55, with stepped portion 71 of housing 20 resting upon first rim 57 and lip portion 75 resting upon second rim 58. Housing 20 can also be adhesively secured in place, such as with a sodium silicate adhesive. Although depicted in FIG. 1 as a cylindrical container with a cylindrical lip, it again should be understood that housing 20, stepped portion 71 and lip portion 75 could be formed to fit a desired shape chosen for storage cavity 55 and first and second rims 57 and 58. It should also be understood that housing 20 need not include a stepped portion 71 or a lip portion 75. Further, storage cavity 55 need not be formed with first and second rims 57 and 58.

[0013] Next, casing 25 is formed about side portions 45-48 of body portion 15. A handle 82 is preferably attached to one or more of side portions 65-68 of casing 25. Once casing 25 is formed about body portion 15, top wall 30 is mounted over top portion 49 of body portion 15. Likewise, bottom wall 35 is arranged over bottom portion 50 of body portion 15. Preferably top and bottom walls 30 and 35 are attached to casing 25 by welding or by any other conventional method. Electronic media 84 can now be placed into housing 20 through aligned access opening 77. In order to fully assemble storage unit 10, cap 40 is placed over a central opening 90 formed in bottom wall 35 and is secured in place via a locking mechanism 95. At least a portion of cap 40 comprises a fire/heat resistant material 97, such as calcium silicate, with the remainder of cap 40 preferably made of plastic. For aesthetic purposes, a metallic piece may be used for cap 40. Additionally, locking mechanism 95 preferably includes locking pins 100 and 101 extending from either side of cap 40 for locking cap 40 in place. However, other types of standard locking mechanisms could be used. As shown in FIG. 3, locking pins 100 and 101 preferably extend adjacent an inner surface (not labeled) of bottom wall 35 and extend through respective pin holes 78 in housing 20 and into respective pin holes 59 in body portion 15 to provide a tight and secure mounting arrangement.

[0014] Once housing 20 is loaded with electronic media 84 to be stored and protected and cap 40 is locked via locking mechanism 95, storage unit 10 can now be flipped from an access position in which a user can access housing 20 as depicted in FIG. 1, to a storage position in which bottom wall 35 is arranged directly adjacent to, i.e., in a substantially full abutting relationship, a relatively planar supporting surface 110 as depicted in FIG. 2. Handle 82 can aid a user in flipping storage unit 10. Preferably, planar supporting surface 110 is a concrete floor, but can be other flooring surfaces. When storage unit 10 is in its storage position of FIG. 2, an outer portion 115 of cap 40 is preferably substantially flush with bottom wall 35 such that the relatively planar supporting surface 110 and bottom wall 35 with cap 40 about one another. This arrangement assures that little air, and thus little oxygen, is available beneath storage unit 10. This configuration has been found to be critical to the invention and significantly increases the fire and heat resistance of storage unit 10, thereby enabling storage unit 10 to effectively protect electronic media 84 in the case of a fire that generates high levels of heat. It is significant to note that a plastic cap 40 will be protected for a period of time from fire damage when storage unit 10 is in its storage position, but will at least partially melt or be otherwise damaged if storage unit 10 is in its access position during a fire. Thus, a plastic cap 40 can be utilized as an indicator of improper use of storage unit 10.

[0015] To test the invention, two samples of storage unit 10, one metal clad, one plastic wrapped, were subjected to a 30 minute 125 degree Fahrenheit Underwriters Laboratories (UL) 72 Fire Test for fire resistance of record protection equipment. The results from this test can be seen in Table 1.

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[0016] According to the results of the test, storage unit 10 can withstand the high temperatures of a fire without the temperature within housing 20 exceeding 125 degrees Fahrenheit (52 degrees Celsius) for 30 minutes. In fact, it has been found that the temperature within housing 20 does not exceed 125 degrees Fahrenheit (52 degrees Celsius) and the humidity level within the housing 20 does not exceed 80 percent for up to 30 minutes during a fire. Test sample #2 included a body portion 15 comprising an approximately 13.8x13.8 inch (approximately 351 mm x351 mm) rectangular body of molded calcium silicate with an approximately 24 gauge (approximately 0.65 mm) square steel casing 25 and a plastic insert housing 20. A first rim 57, having an approximately 1.5 inch (38 mm) associated wall height with a diameter of approximately 8 inches (200 mm), was formed about storage cavity 55 having a height of approximately 5 inches (approximate 150 mm) and a diameter of approximately 6 inches (approximately 150 mm).

[0017] FIG. 3 depicts an alternative embodiment of storage unit 10 in which a square cap 40 is attached to bottom wall 35 by a pair of hinges 120. Although not shown, storage cavity 55, first rim 57, second rim 58, and housing 20 can take on a shape corresponding to that of cap 40 or can be simply shaped as described above and shown in the drawings. Again, the exact shape of storage cavity 55, first and second rims 57 and 58, housing 20 and cap 40, 40 can take on any form and should not be seen as limiting the present invention. More importantly, in connection with either embodiment, a fire and heat resistant storage unit 10, 10 is provided which can be easily and inexpensively manufactured, is readily transported/portable, and allows a user to protect store electronic media, such as CDs or DVDs, in a safe convenient manner. Again, a major key to the present invention is the way in which storage unit 10, 10 is adapted to be stored with cap 40, 40 extending directly along a substantially planar support surface 110. With cap 40, 40 abutting substantially planar support surface 110, little air is available beneath storage unit 10, 10 and thus little heated air can find its way between cap 40, 40 and outer shell 22,
and into housing 20. This arrangement substantially increases the fire and heat resistance of storage unit 10, 10', allowing for the safe-keeping of heat sensitive electronic media in a simple and effective manner.

[0018] Although described with reference to preferred embodiments of the invention, it should be readily understood that various changes and/or modifications can be made to the invention without departing from the spirit thereof. In general, the invention is only intended to be limited by the scope of the following claims.

I/We claim:
1. A fire and heat resistant storage unit for storing electronic media comprising:
   a body portion formed at least in part by calcium silicate having top, bottom and multiple opposing side walls, the bottom wall including a storage cavity formed substantially centrally therein;
   a housing including a bottom portion, at least one side portion and a lip portion opposite the bottom portion that establishes an access opening, said housing extending into the storage cavity of the body portion with the access opening being exposed;
   an outer shell having top, bottom and multiple opposing side walls that collectively encase the body portion, said outer shell including a substantially central opening formed in the bottom wall and leading into the housing; and
   a cap adapted to extend across and close the access opening of the housing, the cap being formed, at least in part, by a material selected from the group consisting of: calcium silicate, vermiculite, perlite, and a combination thereof, wherein, when electronic media is placed in the housing, the access opening of the housing is closed by the cap, the bottom wall of the storage enclosure is supported upon a substantially planar support surface, and the storage enclosure is subjected to high temperatures developed by a fire, a temperature in the housing does not exceed 125 degrees Fahrenheit (52 degrees Celsius) for at least 30 minutes.
2. The storage unit according to claim 1, wherein the housing fits snugly within the storage cavity of the body portion.
3. The storage unit according to claim 1, further comprising:
   a first rim formed about the periphery of the storage cavity, wherein the lip portion is positioned adjacent the rim.
4. The storage unit according to claim 1, further comprising:
   a second rim formed about the periphery of the storage cavity, wherein a stepped portion of the housing is positioned adjacent the second rim.
5. The storage unit according to claim 1, wherein the housing is formed of plastic.
6. The storage unit according to claim 5, wherein the outer shell is formed of sheet metal.
7. The storage unit according to claim 1, further comprising:
   a handle attached to one of the multiple opposing side walls of the outer shell.
8. The storage unit according to claim 1, further comprising:
   a locking mechanism carried by the cap for selectively securing the cap to the body portion.
9. The storage unit according to claim 8, wherein the locking mechanism includes at least one locking pin extending into the body portion.
10. The storage unit according to claim 1 wherein, upon exposing the enclosure to high temperatures developed by a fire, a humidity level in the housing does not exceed 80 percent for up to 30 minutes.
11. A method of storing electronic media in a fire and heat resistant storage unit comprising:
   positioning the storage unit, which includes an outer shell encasing an internal body portion formed from a fire resistant material, in an access position wherein a removable cap, formed at least in part from a fire resistant material selected from the group consisting of: calcium silicate, vermiculite, perlite, and a combination thereof, is exposed along a bottom wall of the storage unit;
   removing the cap from a central opening formed in the bottom wall of the outer shell in order to expose an access opening in a housing positioned in a storage cavity formed substantially centrally in the internal body portion;
   placing electronic media into the housing through the central opening and the access opening;
   closing the access opening in the housing by replacing the cap across the central opening formed in the bottom wall; and
   flipping the storage unit from the access position to a storage position in which the bottom wall of the outer shell is placed against and supported on a substantially planar support surface, wherein upon exposing the storage unit to high temperatures developed by a fire, a temperature in the housing is prevented from exceeding 125 degrees Fahrenheit (52 degrees Celsius) for at least 30 minutes.
12. The method of claim 11, further comprising:
   utilizing a handle attached to one of multiple opposing side walls of the outer shell to flip the unit from the access position to the storage position.
13. The method of claim 11, further comprising:
   securing the cap to the outer shell using a locking mechanism.
14. The method of claim 13, wherein the cap is secured to the outer shell with at least one locking pin of the locking mechanism extending into the internal body portion.
15. The method of claim 11, wherein placing the electronic media into the housing constitutes placing the electronic media in a plastic housing.
16. The method of claim 15 wherein, upon exposing the storage unit to the high temperatures developed by a fire, a humidity level in the housing does not exceed 80 percent for up to 30 minutes.
17. A method of forming and arranging a fire resistant enclosure for storing electronic media comprising:
forming a body from a fire resistant material including calcium silicate, while creating a region in the body which is void of the fire resistant material and includes a first rim;

positioning a plastic insert in the region, said plastic insert including a bottom portion, a side portion and a lip portion that defines an access opening to a housing created by the bottom and side portions;

covering the body with an outer shell including top, bottom and multiple opposing side walls, while aligning a substantially central opening formed in the bottom wall of the outer shell with the access opening of the plastic insert;

placing electronic media into the housing of the plastic insert through the aligned central and access openings;

closing the access opening with a cap member formed, at least in part, from a fire resistant material selected from the group consisting of: calcium silicate, vermiculite, perlite, and a combination thereof; and

placing the bottom wall of the outer shell and cap member on a supporting surface wherein, upon exposing the enclosure to high temperatures developed by a fire, a temperature in the storage cavity does not exceed 125° F. (52° C.) for at least 30 minutes.

18. The method of claim 17, wherein the enclosure is formed and arranged such that, upon exposing the enclosure to high temperatures developed by a fire, the temperature in the storage cavity does not exceed 125° F. (52° C.) and a humidity level in the storage cavity does not exceed 80 percent for up to 30 minutes.

19. The method of claim 17, further comprising:

positioning the plastic insert with the lip portion adjacent the first rim.

20. The method of claim 17, further comprising:

positioning the plastic insert with a stepped portion of the plastic insert adjacent a second rim located about the periphery of the first rim.