FILING CABINET WITH WATERPROOF SEAL

Inventor: Donald J. Ehrlich, Lafayette, IN (US)

Correspondence Address:
TREXLER, BUSHNELL, GIANGIORGI, BLACKSTONE & MARR, LTD.
105 WEST ADAMS STREET
SUITE 3600
CHICAGO, IL 60603 (US)

Appl. No.: 10/843,604
Filed: May 11, 2004

Publication Classification
(51) Int. Cl. ..................................................... A47B 96/00
(52) U.S. Cl. ..................................................... 312/296

ABSTRACT

A waterproof, fire resistant filing cabinet is provided. The cabinet includes a frame defining insulated drawer cavities. A seal point projects forwardly from the cabinet frame. A drawer is mounted in each drawer cavity and has a drawer head. A seal is provided between the seal point and the drawer head. When the drawer is closed, the seal collapses to prevent water from entering the drawer cavity but is not compressed.
FILING CABINET WITH WATERPROOF SEAL

BACKGROUND OF THE INVENTION

[0001] This invention is directed to a filing cabinet having a water proof seal.

[0002] Filing cabinets typically include multiple drawers mounted within a cabinet frame. Each drawer typically includes a drawer head which abuts the cabinet frame when the drawer is in its closed position. Fireproof filing cabinets are available to protect valuable documents stored within the filing cabinet and to avoid significant losses from fire damage. Often, however, when a fire breaks out, it is necessary to extinguish the fire using water. Although many cabinets prevent fire damage to documents, water enters the cabinet and destroys the documents. Therefore, it is desirable to provide a filing cabinet which protects the contents of such cabinet against both fire and water damage.

[0003] Past attempts to provide waterproof filing cabinets typically rely on a compression seal mounted between the cabinet frame and drawer heads to prohibit the entrance of water into the filing cabinet. To seal the drawer against the cabinet frame the seal is compressed between the cabinet frame and the drawer head. Compression of the seal requires a significant amount of inertia (i.e. the drawer must be slammed shut, similar to the closing of a car door). Each drawer typically also includes some type of latch mechanism to secure the drawer in its closed position. Because of the pressure created by the seal, the latch mechanism used must be of the type which can release under such pressure.

[0004] The present invention provides a filing cabinet which overcomes the problems presented in the prior art and which provides additional advantages over the prior art, such advantages will become clear upon a reading of the attached specification in combination with a study of the drawings.

OBJECTS AND SUMMARY OF THE INVENTION

[0005] A general object of the present invention is to provide a waterproof filing cabinet.

[0006] Another object of the present invention is to provide a fire resistant filing cabinet.

[0007] Still another object of the present invention is to provide a waterproof filing cabinet having drawers which can be closed without requiring a large amount of force.

[0008] A further object of the present invention is to provide a filing cabinet which can incorporate a typical latch mechanism.

[0009] Briefly, and in accordance with the foregoing, a fire resistant, waterproof filing cabinet is provided. The filing cabinet includes a frame forming at least one insulated drawer cavity and having a seal point around the perimeter of the drawer cavity. A drawer including a drawer head is mounted within the drawer cavity. A seal is mounted on the inner surface of the drawer head. When the drawer is closed, the seal point collapses the seal and prevents water from entering the drawer cavity.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The organization and manner of the structure and operation of the invention, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the accompanying drawings, wherein like reference numerals identify like elements in which:

[0011] FIG. 1 is a perspective view of a filing cabinet which incorporates the features of the present invention;

[0012] FIG. 1a is an enlarged perspective view of a portion of the filing cabinet of FIG. 1;

[0013] FIG. 2 is a cross-sectional view of a portion of the top wall of the filing cabinet and a portion of a drawer, shown in a partially closed position; and

[0014] FIG. 3 is a cross-sectional view of a portion of the top wall of the filing cabinet and a portion of a drawer, shown in a closed position.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

[0015] While the invention may be susceptible to embodiment in different forms, there is shown in the drawings, and herein will be described in detail, a specific embodiment with the understanding that the present disclosure is to be considered an exemplification of the principles of the invention, and is not intended to limit the invention to that as illustrated and described herein.

[0016] A filing cabinet 20 which incorporates the features of the present invention is shown in FIG. 1. The filing cabinet 20 includes a frame 22, drawer supports 24 mounted within the frame 22, and drawers 26 mounted within the drawer supports 24.

[0017] The frame 22 of the filing cabinet 20 is generally rectangularly-shaped and includes a generally horizontal top wall 30, a generally horizontal bottom wall 32, and a generally vertical right wall 36, and horizontal partitions 40a, 40b, 40c. The frame 22 of the filing cabinet 20 is formed from metal, preferably steel and defines a frame cavity 42. The top wall 30, the bottom wall 32, the left wall 34, the right wall 36, and the rear wall 38 generally define an open front 43. The filing cabinet 20 shown in FIG. 1 is designed to receive four (4) drawers and therefore includes three horizontal partitions 40a, 40b, and 40c. It is to be understood, however, that the filing cabinet 20 could consist of any number of partitions such that the frame would receive the desired number of drawers 26. It is also to be understood that the frame 22 can be designed without partitions such that the frame would receive a single drawer 26 extending from the top wall 30 to the bottom wall 32 and from the left wall 34 to the right wall 36.

[0018] The rear wall 38 includes an inner panel 38a and an outer panel 38b. The inner and outer panels 38a, 38b are spaced apart from each other. The inner panel 38a of the rear wall 38 does not extend the full height or width of the outer panel 38b. Insulation, for example, insulation sold under the trademark, INSULITE®, by E. H. O’Neill Company, Inc., is provided between the inner and outer panels 38a, 38b of the rear wall 38.

[0019] The top wall 30, the bottom wall 32, the left wall 34, and the right wall 36 are each formed from an inner panel and an outer panel. The top wall 30 includes an inner panel 30a and an outer panel 30b. The bottom wall 32 includes an
inner panel (not shown) and an outer panel 32b. The left wall 34 includes an inner panel 34a and an outer panel 34b. The right wall 36 includes an inner panel 36a and an outer panel 36b.

Each inner panel of the top, bottom, left and right walls 30, 32, 34, 36 extends from the inner panel 38a of the rear wall 38. Preferably, the inner panel 38a of the rear wall 38 and the inner panels of the top wall 30, the bottom wall 32, the left wall 34 and the right wall 36 are integrally formed to provide a single-piece, seamless inner frame. Because no seams are provided, gaps through which air and water might penetrate the inner frame are eliminated.

Each outer panel of the top, bottom, left and right walls 30, 32, 34, 36 extends from the outer panel 38b of the rear wall 38. Preferably, the outer panel 38b of the rear wall 38 and the outer panels of the top wall 30, the bottom wall 32, the left wall 34 and the right wall 36 are integrally formed to provide a single-piece, seamless outer frame. Because no seams are provided, gaps through which air and water might penetrate the outer frame are eliminated.

Because the inner panel 38a of the rear wall 38 does not extend the full height or width of the outer panel 38b, the inner panel 30a of the top wall 30 is spaced from the outer panel 30b of the top wall 30, and the inner panel of the bottom wall 32 is spaced from the outer panel 32b of the bottom wall 32, the inner panel 34a of the left wall 34 is spaced from the outer panel 34b of the left wall 34, and the inner panel 36a of the right wall 36 is spaced from the outer panel 36b of the right wall 36. Thus, the integrally formed, seamless inner frame is nested within the integrally-formed, seamless outer frame.

At the ends of each inner and outer panel opposite the rear wall, a joint is provided between the inner and outer panels of each wall 30, 32, 34, 36 which is described in detail herein with respect to the top wall 30. It is to be understood that the joint of the bottom wall 32, left wall 34, and right wall 36 are identically formed except that the joint is generally vertically oriented on the left wall 34 and the right wall 36 and generally horizontally oriented on the top wall 30 and the bottom wall 32.

A portion of the top wall 30 is shown in FIG. 2. As shown in FIG. 2, the outer panel 30b of the top wall 30 includes a first portion 44a, a second portion 44b, a third portion 44c, a fourth portion 44d, and a fifth portion 44e. The first portion 44a of the outer panel 30b extends perpendicularly from the outer panel 38b of the rear wall 38. The second portion 44b of the outer panel 30b extends downwardly and perpendicularly from the first portion 44a. The third portion 44c of the outer panel 30b extends rearwardly from the second portion 44b and is perpendicularly thereto. The fourth portion 44d extends downwardly from the third portion 44c and is perpendicular thereto. The fifth portion 44e extends forward from the fourth portion 44d and is perpendicular thereto. The fifth portion 44e terminates in a free end. The third portion 44c, the fourth portion 44d, and the fifth portion 44e define a groove 46. The inner panel 30a of the top wall 30 extends from the inner panel 38a of the rear wall 38 at a position which is beneath the fifth portion 44e of the outer panel 30b. A hook-shaped end 48 of the inner panel 30a extends around the free end of the fifth portion 44e of the outer panel 30b of the top wall 30 to form an elongated seal point 50 which extends horizontally from the inner panel 34a of the left wall 34 to the inner panel 36a of the right wall 36. Insulation 52, for example, insulation sold under the trademark INSULITE®, is provided between the inner panel 30a and the outer panel 30b of top wall 30 to provide fire resistance.

The horizontal partitions 40a, 40b, 40c are mounted within the frame cavity 42 so as to define drawer cavities 56a, 56b, 56c, 56d. Each horizontal partition 40a, 40b, 40c extending from the inner panel 38a of the rear wall 38 to the front edges of the left and right walls 34, 36 and from the inner panel 34a of the left wall 34 to the inner panel 36a of the right wall 36. Each horizontal partition 40a, 40b, 40c includes an upper panel 58, a lower panel 60, and a forwardly projecting front edge 62. The front edge 62 is formed so as to provide an elongated upper seal point 64 and an elongated lower seal point 66. Insulation, for example, insulation sold under the trademark INSULITE®, is provided between the upper and lower panels 58, 60 of each horizontal partition 40a, 40b, 40c. An aperture (not shown) is provided through upper and lower panels 58, 60 of each horizontal partition 40a, 40b, 40c for receiving a latch as will be described herein. Each aperture is spaced from the front edge of the horizontal partitions 40a, 40b, 40c.

A first drawer cavity 56a is defined by the inner panel 30a of the top wall 30, the inner panel 34a of the left wall 34, the inner panel 36a of the right wall 36, the upper panel 58 of the partition 40a and the inner panel 38a of the rear wall 38. The seal point 50 of the top wall 30 is along with the seal points of the left and right walls 34, 36 and the upper seal point 64 of partition 40a define the perimeter of the opening of the drawer cavity 56a. A second drawer cavity 56b is defined by the lower panel 60 of the partition 40a, the inner panel 34a of the left wall 34, the inner panel 36a of the right wall 36, the upper panel 58 of the partition 40b and the inner panel 38a of the rear wall 38. A third drawer cavity 56c is defined by the lower panel 60 of the partition 40b, the inner panel of the left wall 34, the inner panel 36a of the right wall 36, the upper panel 58 of the partition 40c and the inner panel 38a of the rear wall 38. A fourth drawer cavity 56d is defined by the lower panel 60 of the partition 40c, the inner panel 34a of the left wall 34, the inner panel 36a of the right wall 36, the inner panel 32a of the bottom wall 32 and the inner panel 38a of the rear wall 38.

A pair of drawer supports 24 are provided within each drawer cavity 56a, 56b, 56c, 56d. The drawer supports 24 extend from the front edges of the left and right walls 34, 36 toward the rear wall 38.

A drawer 26 is mounted within each drawer cavity 56a, 56b, 56c, 56d through the use of the drawer supports 24. Each drawer 26 includes a base 70, a left wall 72 at a left end of the base 70, a right wall 74 at the opposite end of the base 70, a rear wall 76 at the rear end of the base 70. The drawer head 78 is perpendicular to the base 70 and to the left and right side walls 72, 74. Thus, each drawer 26 defines an open top. Each drawer 26 includes a latch mechanism 80 attached to the drawer head 78. The drawer head 78 of one of the middle drawers is not shown in FIG. 1 so as to show the latch mechanism 80. The latch mechanism 80 includes a plunger 82 which can be raised an lowered by grasping a latch handle 84 provided on the outer surface of each drawer head 78. The plunger 82 extends into the aperture through the partition 40 to retain the drawer 26 in a closed position.
When the user grasps the latch handle 84, the plunger 82 is raised above the upper panel 58 of the horizontal partition 40 and the drawer 26 can be pulled open.

[0029] As shown in FIG. 1, each drawer head 78 includes a top side 86, a bottom side 88, a left side 90, and a right side 92. As shown in FIGS. 2 and 3, each drawer head 78 also includes an inner panel 54 and an outer panel 96. The panels 94, 96 are spaced apart and insulation 97 is provided between the panels 94, 96 to protect the cabinet contents from fire. The top side 86, the bottom side 88, the left side 90 and the right side 92 of each drawer head 78 includes a rearwardly extending projection 98 and a groove 100. The projection 98 is formed from a first portion 98a, a second portion 98b and a third portion 98c. The first portion 98a extends rearward and perpendicularly from the outer panel 96 of the drawer head 78. The second portion 98b extends perpendicularly from the first portion 98a. The third portion 98c extends forwardly and parallel to the first portion 98a. The groove 100 also extends around the perimeter of the drawer head 78 and thus provides a top portion, a bottom portion, a left side portion and a right side portion. The groove 100 is defined by the third portion 98c of the projection 98, a base 104 which extends perpendicularly to the third portion 98c and a rear extension 105 which extends rearwardly from the base 104 and is generally perpendicular to the base 104. A seal 102 is provided at the base 104 of the groove 100.

[0030] The seal 102 includes a base portion 102a and an arcuate portion 102b. The base portion 102a includes an inner surface 103 and an outer surface 105 which abuts the base portion 104 of the groove 100. The seal 102 is mounted to the base portion 104 of the groove 100 by suitable means. The arcuate portion 102b includes an inner surface 107 and an outer surface 109. Preferably, the seal 102 is formed from a silicon material having a low durometer. Preferably the durometer of the seal 102 is approximately 40 Shore A. The seal 102 is formed from material designed to withstand high temperatures. The height of the seal 102, represented by h, is preferably 0.440 inches. The width of the seal 102, represented by w, is preferably 0.25 inches. The thickness of the base portion 102a, represented by t1, is preferably 0.025 inches. The thickness of the arcuate portion 102b, represented by t2, is preferably 0.035 inches.

[0031] When the drawer 26 is open, the seal 102 is fully extended and is generally D-shaped. As shown in FIG. 2, when the drawer 26 is moved toward the closed position, the rearwardly extending projection 98 of the drawer head 78 extends within the groove 46 of the frame 22 of the cabinet 20. As the user continues to close the drawer 26, the seal point 50 contacts the outer surface 109 of the arcuate portion 102b of the seal 102 and causes the seal 102 to collapse. As shown in FIG. 1A and FIG. 3, when the drawer 26 is fully closed, the seal 102 is in a generally B-shaped formation. In the fully closed position, a gap 111 is provided between the seal point 50 and the base 104 of the groove 100. The width of the gap 111, represented by t3, is 0.060 inches. In its collapsed formation, the inner surface 107 of the arcuate portion 102b of the seal 102 contacts the inner surface 103 of the base portion 102a of the seal 102. Thus, the thickness of the collapsed seal 102, approximate the seal point 50, is also 0.060 inches. Because the gap 111 between the base 104 of the groove 100 of the drawer head 78 and the seal point 50 is also 0.060 inches, when the drawer 26 is closed, the seal 102 is not compressed upon closure of the drawer 26. Rather, the seal 102 is simply collapsed. As a result, a water and air tight engagement is provided between the drawer head 78 and the frame 22 of the cabinet 20 without requiring pressure between the drawer head 78 and the frame 22 of the cabinet 20. Because compression of the seal 102 is not required, the drawer 26 does not need to be "slammed" shut in order to fully close the drawer 26. Thus, when the drawer 26 is shut, the plunger 82 of the latch mechanism 80 falls within the aperture through the horizontal partition 40 and no pressure is provided between the plunger 82 of the drawer head 78 and the partition 40 of the frame 22. Because pressure is not provided between the drawer head 78 and the frame 22, the latch mechanism 80 can be easily operated. It is to be noted, upon closure of each drawer 26 the drawer cavity 56 within which the drawer 26 is mounted is sealed. Thus, in the event one drawer remains open, a water and air tight seal is provided for the remaining drawers which are closed.

[0032] While a preferred embodiment of the present invention is shown and described, it is envisioned that those skilled in the art may devise various modifications of the present invention without departing from the spirit and scope of the appended claims.

The invention claimed is:

1. A waterproof filing cabinet comprising:
   a frame including a plurality of walls defining a drawer cavity and a drawer opening, said walls which form the drawer opening including a seal point;
   a drawer mounted within said drawer cavity, said drawer including a drawer head;
   a collapsible seal positioned between said seal point and said drawer head;
   wherein when said drawer is in an open position, said seal is in an extended formation, and when said drawer is in a closed position, said seal point causes said seal to collapse without compression.

2. A filing cabinet as defined in claim 1, wherein each of said walls includes an inner panel and an outer panel and insulation is provided between said inner panels and said outer panels.

3. A filing cabinet as defined in claim 2, wherein a portion of said inner panel is formed around a portion of said outer panel to form said seal point.

4. A filing cabinet as defined in claim 2, wherein said outer panels of said walls are integrally formed.

5. A filing cabinet as defined in claim 2, wherein said inner panels of said walls are integrally formed.

6. A filing cabinet as defined in claim 2, wherein said seal is D-shaped in said extended formation.

7. A filing cabinet as defined in claim 2, wherein said seal is B-shaped when collapsed.

8. A filing cabinet as defined in claim 1, wherein said seal is D-shaped in said extended formation and said seal is B-shaped when collapsed.

9. A filing cabinet as defined in claim 1, wherein said drawer head includes a rearwardly extending projection and a groove, said seal being mounted within said groove, and said seal point of said frame extending into said groove when the drawer is in said closed position.
10. A filing cabinet as defined in claim 9, wherein said groove includes a base and said seal abuts said base of said groove.

11. A filing cabinet as defined in claim 10, wherein said seal is D-shaped in said extended formation and said seal is B-shaped when collapsed.

12. A filing cabinet as defined in claim 1, wherein the durometer of said seal is approximately 40 shore A.

13. A filing cabinet as defined in claim 12, wherein said seal is D-shaped in said extended formation and said seal is B-shaped when collapsed.

14. A filing cabinet as defined in claim 1, further including a partition mounted within said frame, said partition having a seal point, said partition defining drawer cavities on either side of said partition.

15. A filing cabinet as defined in claim 14, wherein said partition includes an upper panel and a lower panel, and wherein insulation is provided between said upper and lower panels.

16. A filing cabinet as defined in claim 15, wherein said seal point is defined by said upper and lower panels.

17. A filing cabinet as defined in claim 15, wherein said partition includes an upper seal point and a lower seal point.

18. A waterproof filing cabinet comprising:

- a frame including a top wall, a bottom wall, a left wall, a right wall and a rear wall defining a drawer cavity, each of said walls including inner and outer panels, a drawer opening defined by said top, bottom, left and right walls, and wherein a portion of each said inner panel is formed around a portion of each said outer panel to form a seal point around said drawer opening;
- a drawer mounted within said drawer cavity, said drawer including a drawer head, said drawer head including a rearwardly extending projection and a groove;
- a collapsible seal mounted within said groove and positioned between said seal point and said drawer head; and
- wherein when said drawer is in an open position, said seal is in an extended formation, and when said drawer is in a closed position, said seal point causes said seal to collapse without compression.

19. A filing cabinet as defined in claim 18, wherein said seal is D-shaped in said extended formation and said seal is B-shaped when collapsed.

20. A filing cabinet as defined in claim 18, wherein said inner panels of said walls are integrally formed and said outer panels of said walls are integrally formed.

21. A filing cabinet as defined in claim 18, further including insulation between said inner and outer panels of said top wall, said bottom wall, said left wall, said right wall and said rear wall.

22. A filing cabinet as defined in claim 18, further including a partition mounted within said frame, said partition having a seal point and defining drawer cavities on either side of said partition.

* * * * *