



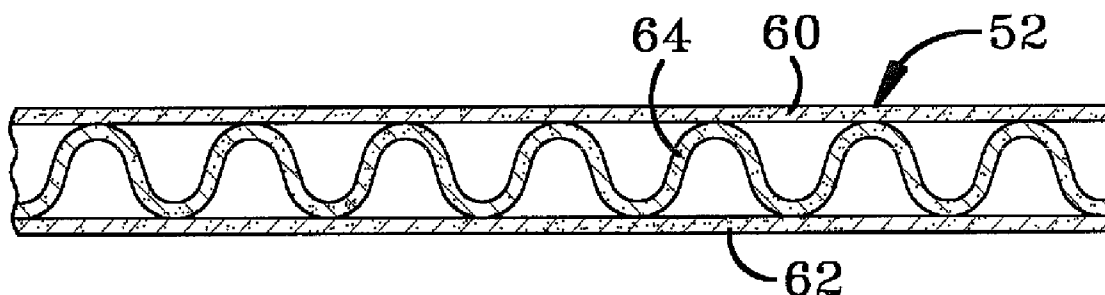
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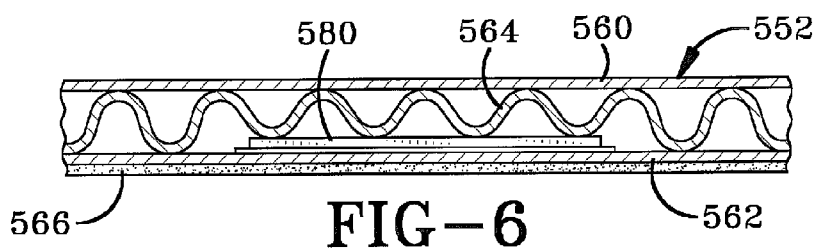
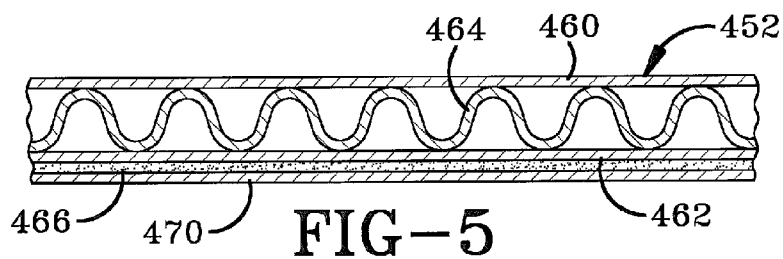
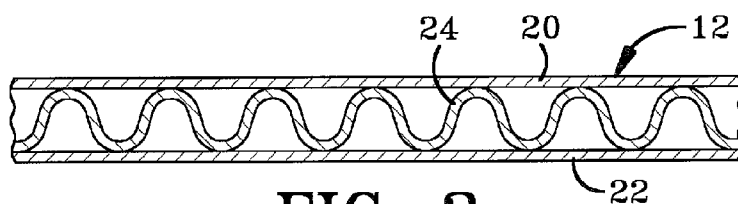
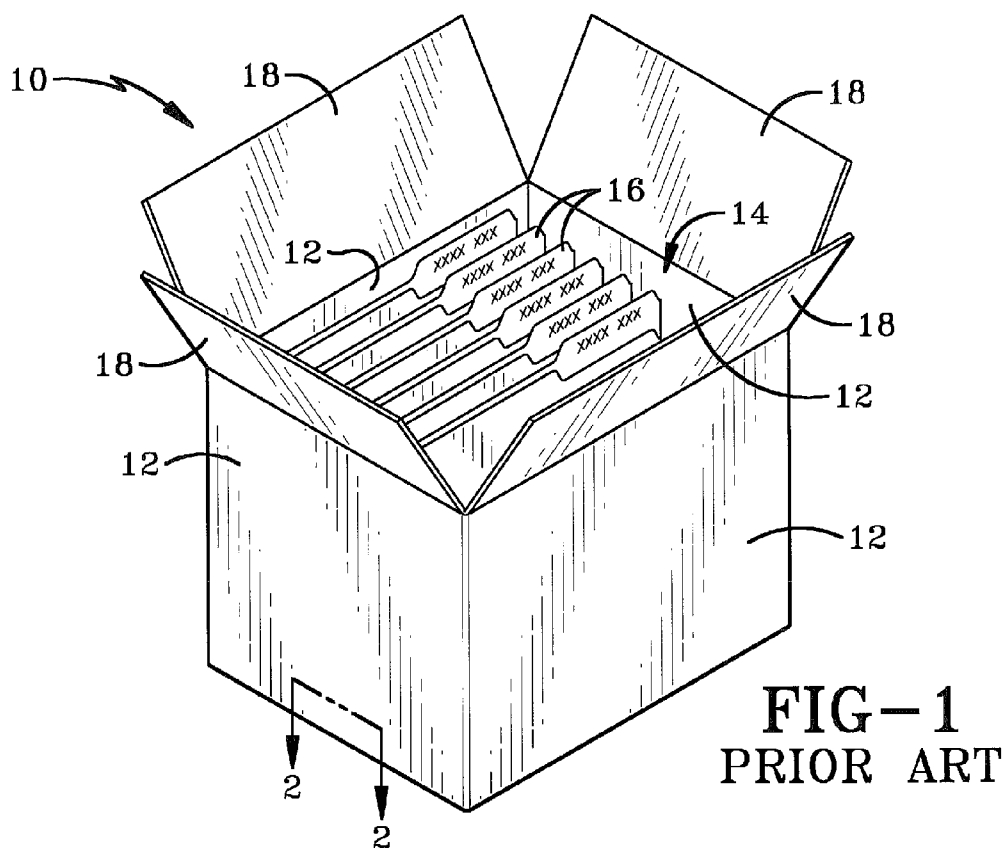
(19) **United States**(12) **Patent Application Publication**
Chandaria(10) **Pub. No.: US 2008/0191001 A1**(43) **Pub. Date: Aug. 14, 2008**(54) **PACKAGING HAVING PROTECTIVE
MATERIALS INCORPORATED THEREIN**(52) **U.S. Cl. 229/100**(57) **ABSTRACT**(76) Inventor: **Kapoor Chandaria, Nairobi (KE)**

Correspondence Address:

SAND & SEBOLT**AEGIS TOWER, SUITE 1100, 4940 MUNSON
STREET, NW
CANTON, OH 44718-3615**(21) Appl. No.: **11/763,685**(22) Filed: **Jun. 15, 2007****Related U.S. Application Data**(63) Continuation-in-part of application No. 11/703,966,
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A packaging article for protectively storing perishable paper products that includes protective materials that protect the packaging article and its contents from any of a number of threats including water damage, fire damage, mold, insects, bacteria, fungi and theft. The packaging article comprises a bottom wall, side walls and a closure that surround and define an interior cavity in which the paper products are stored or transported. Each of the bottom wall, side walls and closure are made from a plurality of layers. Protective materials are applied to one or more of the bottom wall, side walls and closures by either impregnating a paper or cardboard with a suitable chemical, applying a film thereover, spraying a coating thereover or sandwiching the protective material between two adjacent layers. Suitable chemicals that produce the desired properties include, but are not limited to wax, oil, plastic, polybrominated diphenyl ether, polybrominated biphenyl, brominated cyclohydrocarbons, boric acid and hydrogen peroxide. A radio frequency identification tag may also be received within the wall of the packaging article to protect the same against theft.





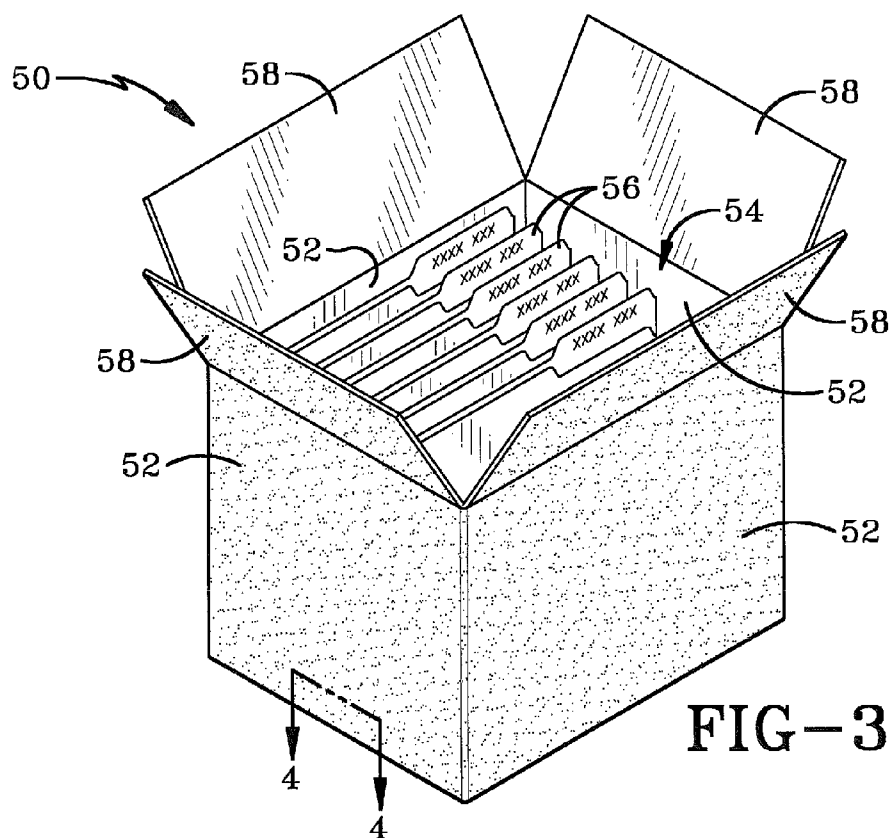


FIG-4

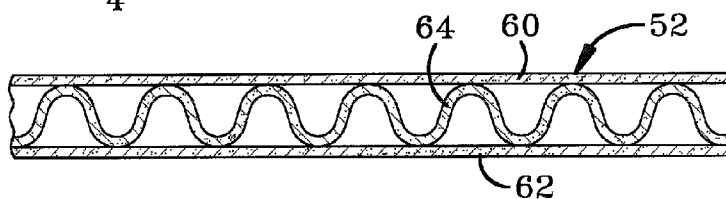


FIG-4A

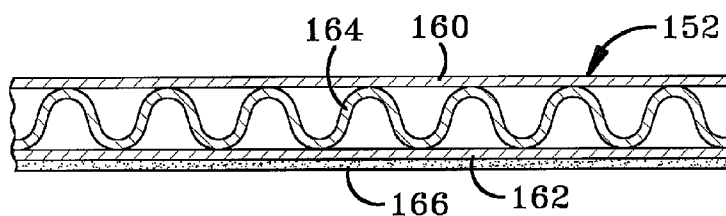


FIG-4B

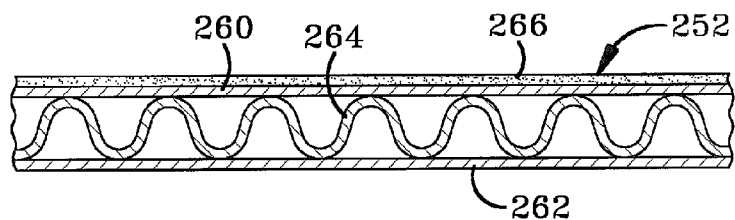
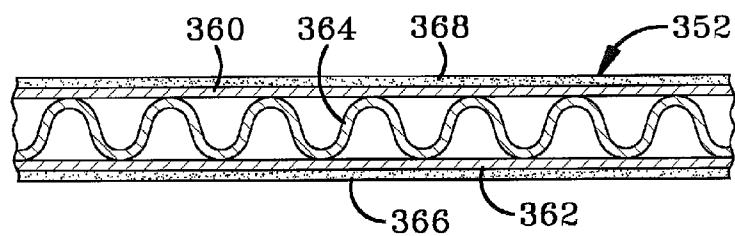


FIG-4C



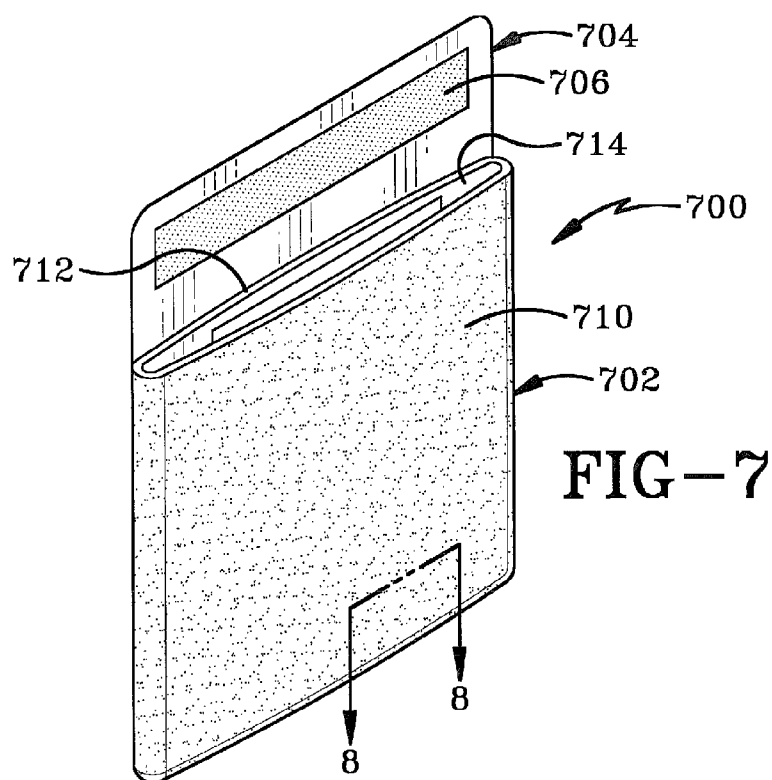


FIG-8

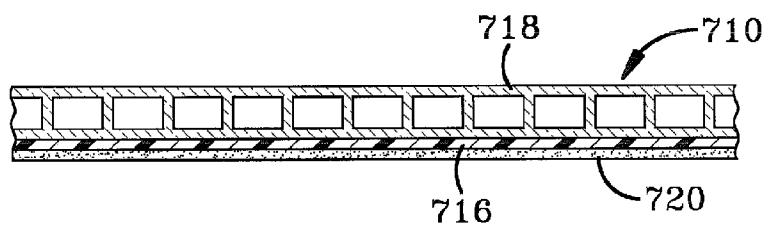


FIG-8A

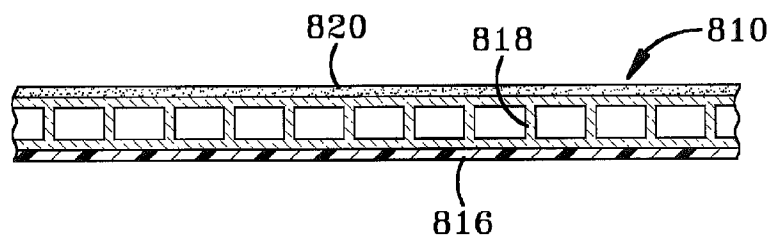


FIG-8B

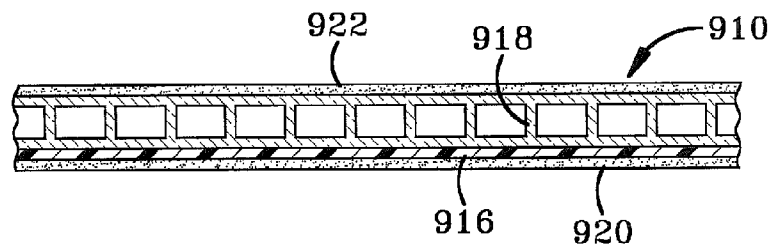
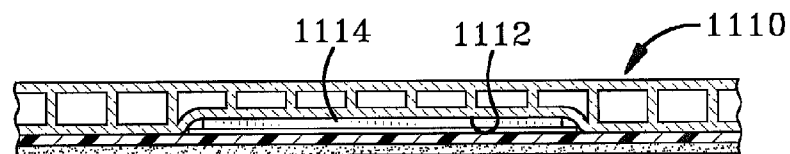


FIG-9



PACKAGING HAVING PROTECTIVE MATERIALS INCORPORATED THEREIN

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. patent application Ser. No. 11/703,966, filed Feb. 8, 2007, the entire specification of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

TECHNICAL FIELD

[0002] This invention generally relates to storage and transportation materials. More particularly, the invention relates to mailing and storage boxes and envelopes. Specifically, the invention relates to boxes and envelopes that are made of a plurality of different layers that have protective materials incorporated therein or applied thereto to protect the article from a variety of different threats.

BACKGROUND INFORMATION

[0003] Offices and individuals frequently need to store materials such as files and papers for long periods of time. Typically, these materials are placed in some sort of storage box for safekeeping. These boxes may take a variety of forms including plastic tubs or corrugated cardboard boxes with lids. Plastic tubs are convenient and protect the materials stored therein from dangers such as liquid exposure, but can be relatively expensive if large volumes of materials need to be stored. Cardboard boxes on the other hand are inexpensive and convenient, but they are vulnerable to dangers such as water damage, fire, insects and mold.

[0004] There is therefore a need in the art for an improved corrugated cardboard box that is less vulnerable to threats that may damage the contents of the box.

SUMMARY OF THE INVENTION

[0005] The device of the present invention comprises a packaging article for protectively storing perishable paper products that includes protective materials that protect the packaging article and its contents from any of a number of threats including water damage, fire damage, mold, insects, bacteria, fungi and theft. The packaging article comprises a bottom wall, side walls and a closure that surround and define an interior cavity in which the paper products are stored or transported. Each of the bottom wall, side walls and closure are made from a plurality of layers. Protective materials are applied to one or more of the bottom wall, side walls and closures by impregnating a paper or cardboard layer with a suitable chemical, applying a film thereover, spraying a coating thereover or sandwiching the protective material between two adjacent layers. Suitable chemicals that produce the desired properties include, but are not limited to wax, oil, plastic, polybrominated diphenyl ether, polybrominated biphenyl, brominated cyclohydrocarbons, boric acid and hydrogen peroxide. A radio frequency identification tag may also be received within the wall of the packaging article to protect the same against theft.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] The preferred embodiments of the invention, illustrative of the best mode in which applicant has contemplated

applying the principles, are set forth in the following description and are shown in the drawings and are particularly and distinctly pointed out and set forth in the appended claims.

[0007] FIG. 1 is a perspective view of a corrugated cardboard box known in the prior art;

[0008] FIG. 2 is a cross-sectional top view through line 2-2 of FIG. 1;

[0009] FIG. 3 is a perspective view of a corrugated cardboard box in accordance with the present invention;

[0010] FIG. 4 is a cross-sectional top view of a first embodiment of a side wall taken through line 4-4 of FIG. 3;

[0011] FIG. 4A is a cross-sectional, top view of a second embodiment of the side wall of the storage box of FIG. 3;

[0012] FIG. 4B is a cross-sectional top view of a third embodiment of the side wall of the storage box of FIG. 3;

[0013] FIG. 4C is a cross-sectional top view of a fourth embodiment of the side wall of the storage box of FIG. 3;

[0014] FIG. 5 is a cross-sectional top view of a fifth embodiment of the side wall of the storage box of FIG. 3;

[0015] FIG. 6 is a cross-sectional top view of a sixth embodiment of the side wall of the storage box of FIG. 3 and showing the incorporation therein of a security tag;

[0016] FIG. 7 is a perspective view of a mailing envelope in accordance with the present invention;

[0017] FIG. 8 is a cross-sectional top view of the mailing envelope taken through line 8-8 of FIG. 7 and showing the structure of the front wall of the envelope;

[0018] FIG. 8A is a cross-sectional top view of a second embodiment of the front wall of the envelope;

[0019] FIG. 8B is a cross-sectional top view of a third embodiment of the front wall of the envelope; and

[0020] FIG. 9 is a cross-sectional top view of a fourth embodiment of the front wall of the envelope showing the incorporation therein of a security tag.

DETAILED DESCRIPTION OF THE INVENTION

[0021] FIGS. 1 and 2 show a corrugated cardboard box 10 known in the prior art. Box 10 has a bottom wall (not shown) and four side walls 12 that define an interior cavity 14 for holding a plurality of files or papers 16. A lid 18 is provided for closing off access to cavity 14. Lid 18 may take any one of a number of different forms, such as four panels as shown in FIG. 1, or a single panel (not shown) or a completely separate lid unit (not shown). The bottom wall, side walls 12 and lid 18 are all made from corrugated cardboard. As shown in FIG. 2, the side wall 12 comprises two planar sheets 20, 22 which sandwich a corrugated cardboard sheet 24 therebetween. The cardboard used in box 10 is vulnerable to water damage, fire damage, may permit mold to grow thereon if it is subjected to high moisture environments and is susceptible to paper-eating insects such as silverfish and the like.

[0022] FIGS. 3-5 show a storage box in accordance with the present invention and generally indicated at 50. Box 50 is similarly formed to box 10 in that it has a bottom wall (not shown), side walls 52 that surround and define an interior cavity 54 for holding a plurality of files or papers 56 therein. A lid 58 is provided for closing off access to cavity 54. Lid 58 shown in FIG. 3 comprises four panels that are secured together with an adhesive tape of the like. It will be understood by those skilled in the art that the shape, size and configuration of box 50, as shown in the attached drawings, is by way of illustration only. Any shape, size and configuration of the box and lid may be used without departing from the spirit of the present invention.

[0023] In accordance with a specific feature of the present invention, each of the bottom wall, side walls **52** and lid **58** of box **50** are manufactured from a corrugated cardboard that has been specially treated with one or more of several protective materials as will be hereinafter described.

[0024] Referring to FIG. 4, there is shown a portion of side wall **52** comprising a first and a second planar sheet **60**, **62** of cardboard which sandwich a corrugated sheet **64** of cardboard thereinbetween. It will be understood by those skilled in the art, that the bottom wall, side walls **52** and lid **58** of box **50** may be made up from any number of a plurality of planar and corrugated sheets that are layered and bonded together to form a unitary member of the required strength, without departing from the spirit of the present invention. The following illustrations show a box wall **52** made from two planar sheets and one corrugated sheet for the sake of clarity only. FIG. 4 illustrates a first embodiment of the side wall **52** in which one or more of sheets **60**, **62** and **64** are impregnated with a protective material as will be hereinafter described.

[0025] FIG. 4A shows a second embodiment of side wall **152** that includes layer of protective material **166** therein. In this instance, layer **166** is applied over second sheet **162** and, because second sheet **162** forms the exterior surface of side wall **152**, protective layer **166** forms the external surface of the storage box.

[0026] Referring to FIG. 4B, there is shown a third embodiment of a side wall of the box, being generally indicated at **252**. Side wall **252** comprises first and second planar sheets **260**, **262** of cardboard which sandwich a corrugated layer **264** thereinbetween. Protective layer **266** is applied over first sheet **260** and thus forms the interior surface of the box in accordance with the present invention.

[0027] Referring to FIG. 4C, there is shown a fourth embodiment of a side wall for the box, being generally indicated at **352**. Side wall **352** comprises first and second planar sheets **360**, **362** of cardboard which sandwich a corrugated layer **364** thereinbetween. A first protective layer **366** is applied over sheet **362** and a second protective layer **368** is applied over sheet **360**. The protective layers **366**, **368** therefore form both the exterior and interior surfaces of the box.

[0028] Referring to FIG. 5, there is shown a fifth embodiment of a side wall for the box, being generally indicated at **452**. Side wall **452** comprises first and second planar sheets **460**, **462** of cardboard which sandwich a corrugated layer **464** thereinbetween. A protective layer **466** is applied over second sheet **462** and another planar sheet of cardboard **470** is applied over protective layer **466**. Thus, protective layer **466** is sandwiched between two layers of untreated cardboard.

[0029] Referring to FIG. 6, there is shown a sixth embodiment of a side wall for the storage box, being generally indicated at **552**. Side wall **552** comprises first and second planar sheets **560**, **562** of cardboard which sandwich a corrugated layer **564** thereinbetween. A protective layer **566** is applied over second sheet **562**. In accordance with another specific feature of the present invention, side wall **552** further incorporates an RFID (Radio Frequency Identification) tag **580**. Tag **580** is sandwiched between corrugated layer **564** and planar sheet **562**. Tag **580** may be used to rapidly locate a particular storage box. Tag **580** may also be used as a security device to set off an entryway alarm if the box is removed from a storage facility by unauthorized personnel. In this way, tag **580** is incorporated as a protective material against the threat of theft.

[0030] In accordance with one of the specific features of the present invention, one or more layers of the bottom wall, side walls **52** and lid **58** of box **50** include protective materials that impart improved protective properties to the storage box **50**. In a first instance, shown in FIG. 4, any or all of sheets **60**, **62** and **64** may be impregnated with a protective material. Thus, any and all of sheets **60**, **62** and **64** constitute a protective layer of box **50**.

[0031] With reference to FIGS. 4A-6, the protective layer will be referred to in the following description as layer **66** for the sake of clarity, but it will be understood that any and all of the protective layers **66**, **68** through to **466** includes one or more protective materials that impart improved protective properties to the storage box. Protective layer **66** may be one of a planar or corrugated sheet of cardboard that is impregnated with the protective material. Alternatively, protective layer **66** may comprise a film that is bonded onto a planar sheet of cardboard. Furthermore, protective layer **66** may constitute a separate thin film. Finally, protective layer **66** may constitute a powder or liquid coating that is sprayed or otherwise deposited onto one of the sheets in the box.

[0032] The protective layer **66** may constitute cardboard that is impregnated with a chemical that renders that layer water impervious or water repellent. The chemical may render the layer fire resistant or fire retardant. The chemical may be a fungicide that prevents mold from growing, or a pesticide that kills insects such as silverfish or that repels such insects because of an odor or taste associated therewith. A wide variety of chemicals are known to produce these properties, but have not been previously applied to corrugated cardboard or have not been applied in combination with each other to cardboard. So, for instance, a wide variety of chemicals and chemical components may be used for these purposes. These include, but are not limited to, a wax, or an oil may be impregnated into the layer, or a plastic film may be used to create a water repellent or resistant layer. Chemicals such as aluminum hydroxide and diammonium phosphate, polybrominated diphenyl ether, polybrominated biphenyl or brominated cyclohydrocarbons can be sprayed or otherwise applied to a one of the layers **60**, **62** or a separate cardboard sheet in order to create a fire retardant layer. Boric acid or hydrogen peroxide may be used in layer **66** to act as a pesticide or fungicide. So, for example, in FIG. 4, one or more of sheets **60**, **62** and **64** may be impregnated with a suitable insecticide to repel insects such as silverfish from box **50**. Or, in FIG. 4A, layer **166** of a suitable fire-retardant chemical may be applied over the outer sheet **162** of the box. Or, in FIG. 4B, a fungicide may be applied as layer **268** over the interior sheet **260** of the box. Or, in FIG. 4C, layer **366** may be a suitable water repellent and layer **368** may be a fire retardant. Or, in FIG. 5, a fire-retardant layer **466** may be sandwiched between two sheets **462**, **470** of cardboard.

[0033] It will be understood by those skilled in the art that one or more or all of these and other chemical compounds may be applied to the cardboard in one or more layers in order to protect the box from one or more of water, fire, insects and mold. Furthermore, any other chemical or substance may be applied to the interior or exterior of box **50**, or may be impregnated into the cardboard layers thereof in order to give the materials thereof the protective qualities that are desired.

[0034] FIGS. 7-9 illustrate a mailing envelope in accordance with the present invention and being generally indicated at **700**. Envelope **700** comprises a pouch **702** and a flap **704**. Flap **704** includes an adhesive layer **706** over which a

protective paper cover (not shown) is applied. The paper cover is removed from layer 706 when the envelope 700 has been stuffed and is to be closed. Flap 704 is folded over into abutting contact with wall 710 and adhesive layer 706 secures flap 704 to wall 710. Preferably, both the pouch 702 and flap 704 incorporate protective materials therein. The protective materials are applied therein to secure the envelope 700 against threats such as fire, water, insects, mold, fungi, bacteria and theft.

[0035] In accordance with one of the specific features of the present invention, walls 710 and 712 are manufactured from a plurality of layers. One or more of those layers include materials that impart protective properties to envelope 700. Walls 710 and 712 may be integrally formed or may be secured together in some suitable manner. Walls 710 and 712 surround and define an interior cavity 714 into which the articles to be mailed are placed.

[0036] FIG. 8 shows a first embodiment of the structure of wall 710. Wall 710 comprises a first layer 716, a second layer 718 and a third layer 720. First layer 716 may be manufactured from any material, such as a paper or cardboard product. Second layer 718 is applied onto a first surface of first layer 716. Second layer 718 is manufactured from a plastic blister-type material and is thus waterproof. Second layer 718 additionally provides cushioning for the articles retained within the cavity 714. Third layer 720 is applied to a second surface of first layer 716. Third layer 720 is provided to protect first layer 716 from a different threat to that of second layer 718. So, for instance, third layer 720 may include a fungicide or a fire-retardant material. As previously described in relation to the storage box, if first layer 716 is a paper product, a protective material may be impregnated directly into that layer. Second and third layers 718, 720 may be applied as a film or sprayed onto first layer 716. The structure of wall 710 is shown by way of illustration only. Any suitable layering of different materials may be utilized to protect the articles within pouch 702 from a variety of different threats such as water damage, fire damage, mold, bacteria, fungi, insects and theft.

[0037] FIG. 8A shows a second embodiment of a possible structure of the envelope wall, said wall being generally indicated at 810. Wall 810 again is made up from a first layer 816, a second waterproof blister-type layer 818 and a third layer 820. In this instance, third layer 820 is applied onto second layer 818 instead of onto the first layer 816. Third layer 820 may include a fire-retardant that protects the blister type second layer 818 from melting.

[0038] FIG. 8B shows a third embodiment of the possible structure of the envelope wall, being generally indicated at 910. Again, wall 910 comprises a first layer 916, a plastic blister-type material second layer 918 applied to a first surface of first layer 916, a third layer 920 applied to a second surface of first layer 916, and a fourth layer 922 applied to a second surface of the second layer 918. Again, each one of the first, second, third and fourth layers 916-922 provides protection against a different threat.

[0039] Finally, FIG. 9 shows a fourth embodiment of the structure of the envelope wall being generally indicated at 1110. The structure of wall 1110 is substantially identical to that of the first embodiment 710 thereof, with the exception that the wall includes a pouch 1112 that surrounds and retains an RFID tag 1114 therein to protect envelope 700 from the threat of theft.

[0040] As with the storage box, the protective layers in envelope 700 may be impregnated into the material of the layer, applied as a film, applied as a spray coating or may be sandwiched between the various layers within envelope 700.

[0041] In the foregoing description, certain terms have been used for brevity, clearness, and understanding. No unnecessary limitations are to be implied therefrom beyond the requirement of the prior art because such terms are used for descriptive purposes and are intended to be broadly construed.

[0042] Moreover, the description and illustration of the invention are an example and the invention is not limited to the exact details shown or described.

1. A packaging article for protectively storing and shipping perishable paper products, wherein said packaging article comprises:

- a bottom wall;
- a plurality of side walls extending upwardly away from the bottom wall to surround and define an interior cavity; said cavity being adapted to retain the paper products therein;
- a closure receivable over an upper end of the side walls to close off said interior cavity;
- a protective material applied to one or more of said bottom wall, side walls and closure to protect the same from one or more threats selected from the group consisting of fire, water, insects, mold, fungi, bacteria and theft.

2. The packaging article as defined in claim 1 wherein the protective material is applied as a film over the one or more of said bottom wall, side walls and lid.

3. The packaging article as defined in claim 1, in which the protective material is sprayed over the one or more of said bottom wall, side walls and lid.

4. The packaging article as defined in claim 1, in which the protective material is sandwiched within the one or more of said bottom wall, side walls and lid.

5. The packaging article as defined in claim 1, in which the protective material is one or more of a wax, an oil, a plastic, aluminum hydroxide, diammonium phosphate, polybrominated diphenyl ether, polybrominated biphenyl, brominated cyclohydrocarbons, boric acid hydrogen peroxide and a radio frequency identification tag.

6. The packaging article as defined in claim 1, wherein each of the bottom wall, side walls and closure of the box includes at least:

- a first planar layer;
- a second layer; said second layer being one of corrugated and blistered; and
- a third planar layer; said third planar layer being applied to one of the first and second layers; and wherein the protective material is applied to one or more of the first, second and third layers.

7. The packaging article as defined in claim 6, wherein the protective material is impregnated into one or more of the first, second and third layers.

8. The packaging article as defined in claim 6, wherein the protective material is applied as a film over one or both of the first and third layers.

9. The packaging article as defined in claim 6, wherein the protective material is sprayed over one or both of the first and third layers.

10. The packaging articles defined in claim 9, wherein the protective layer is sprayed in one of a powder form and a liquid form over the one or both of the first and third layers.

11. The packaging article as defined in claim **6**, wherein the protective material is sandwiched between an adjacent two of the first, second and third layers.

12. The packaging article is defined in claim **6**, wherein the protective material comprises:

a first component that protects the packaged article against a first threat.

13. The packaging article as defined in claim **12**, wherein the first threat is one of water damage, fire damage, mold, insects, bacteria, fungi and theft.

14. The packaging article as defined in claim **12**, wherein the protective material further comprises:

a second component that protects the box against a second threat.

15. The packaging article as defined in claim **14**, wherein the second threat is a different one of water damage, fire damage, mold, insects, bacteria, fungi and theft.

16. The packaging article as defined in claim **14**, wherein the protective material further comprises:

a third component that protects the box against a third threat.

17. The packaging article as defined in claim **16**, wherein the third threat is a further different one of water damage, fire damage, mold, insects, bacteria, fungi and theft.

18. The packaging article as defined in claim **16**, wherein the protective material further comprises:

a fourth component that protects the box against a fourth threat.

19. The packaging article as defined claim **18**, wherein the fourth threat is the last different one of water damage, fire damage, mold, insects, bacteria, fungi and theft.

20. The packaging article as defined in claim **18**, wherein each of the first, second, third and fourth components are selected from the group consisting of a wax, an oil, a plastic, aluminum hydroxide, diammonium phosphate, polybrominated diphenyl ether, polybrominated biphenyl, brominated cyclohydrocarbons, boric acid, hydrogen peroxide and a radio frequency identification tag.

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