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(54) **SECURITY PACKAGING WITH POST RECYCLED CONTENT**

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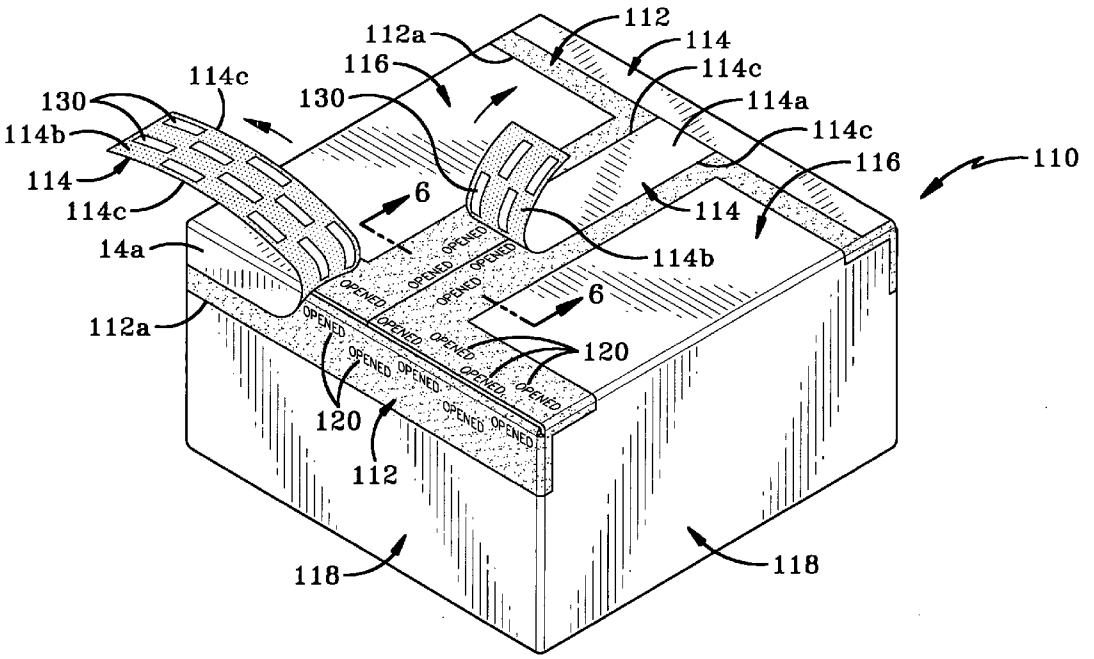
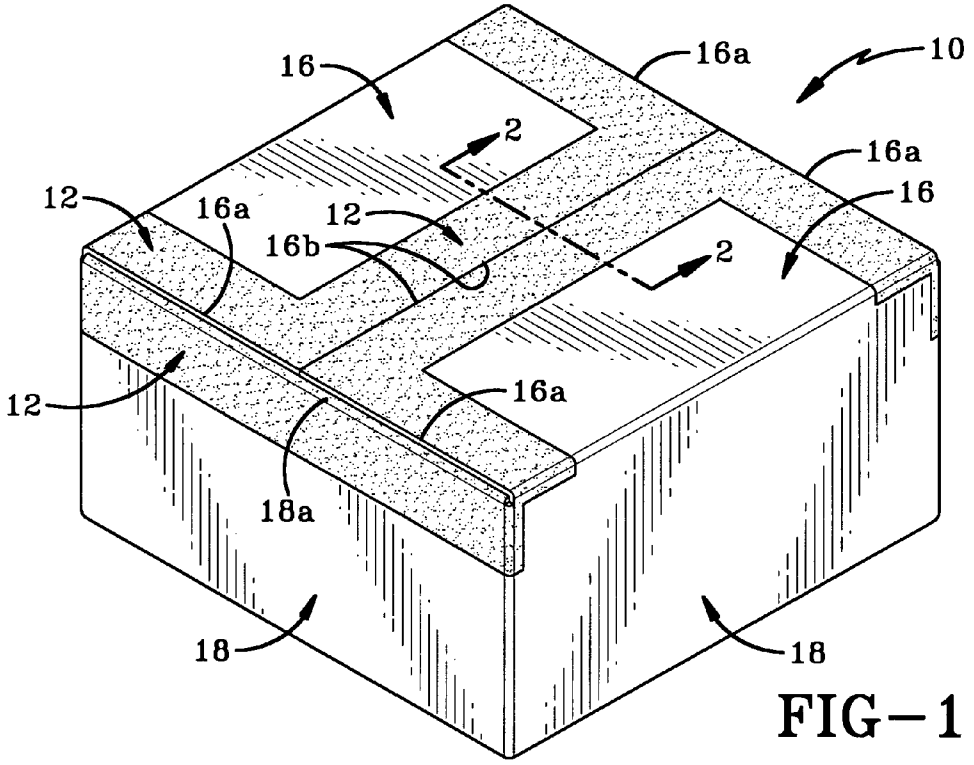
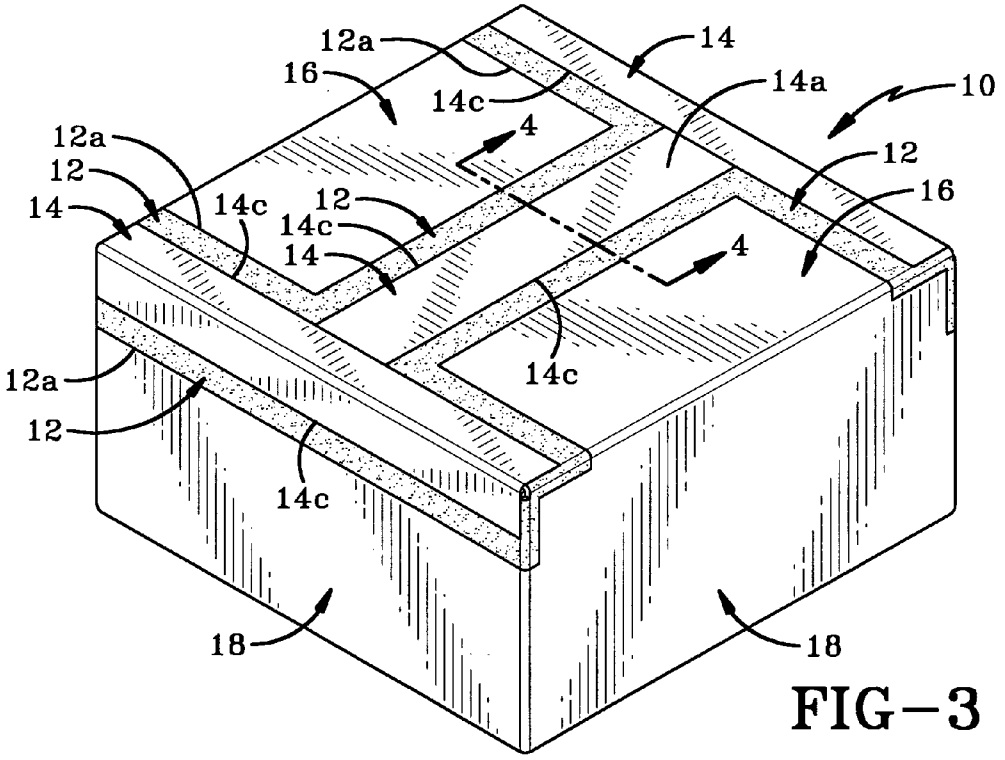
(57) **ABSTRACT**

A packaging box including a lacquer layer applied in a band proximate an outer edge of the upper and side walls of the box. The box is manufactured from a high post recycled content material and the lacquer layer helps packaging tape to adhere to the box and seal the same. Security indicators are applied to one of the lacquer layer and packaging tape to identify whether or not the box has previously been opened by an unauthorized person. The security indicators are applied to the one of the lacquer layer and packaging tape in combination with a layer of release agent so that the security identifier can be revealed when the box has been opened.




16
16a
10
2
16a
12
16a
12
16b
16
2
12
16a
18a
18
18

FIG–1


12a
14
16
14c
14a
10
4
12a
12
12
14
14c
12
16
14c
14
4
14c
12a
12
14c
18
18

FIG–3

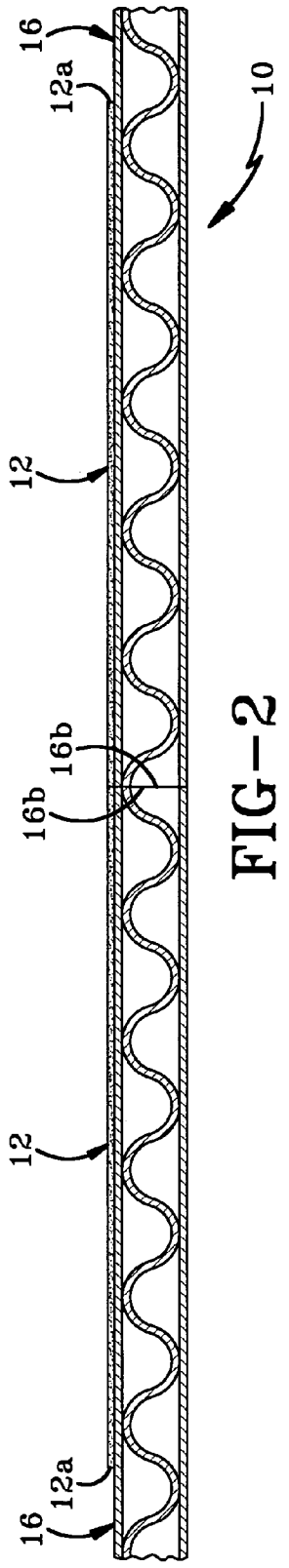

16
12a
10
12
16b
16b
12
16
12a

FIG-2

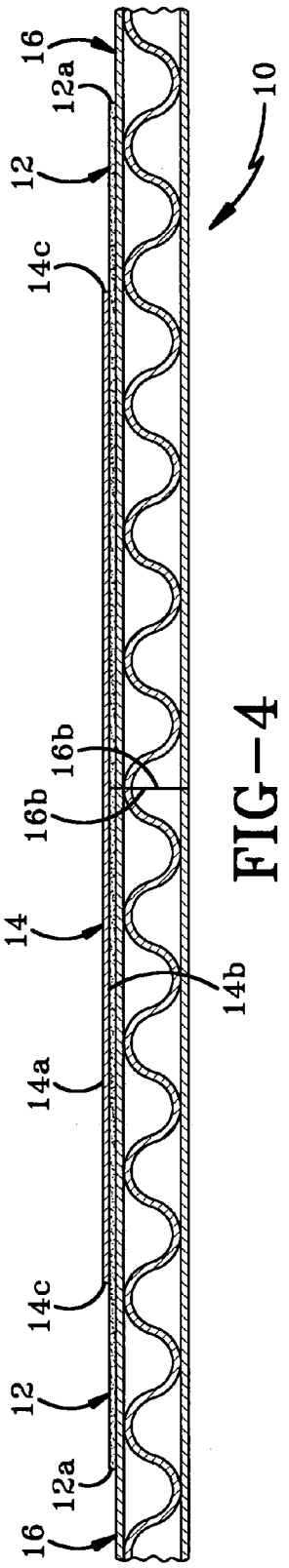

16
12a
10
12
14c
16b
16b
14
14b
14a
14c
12
16
12a

FIG-4

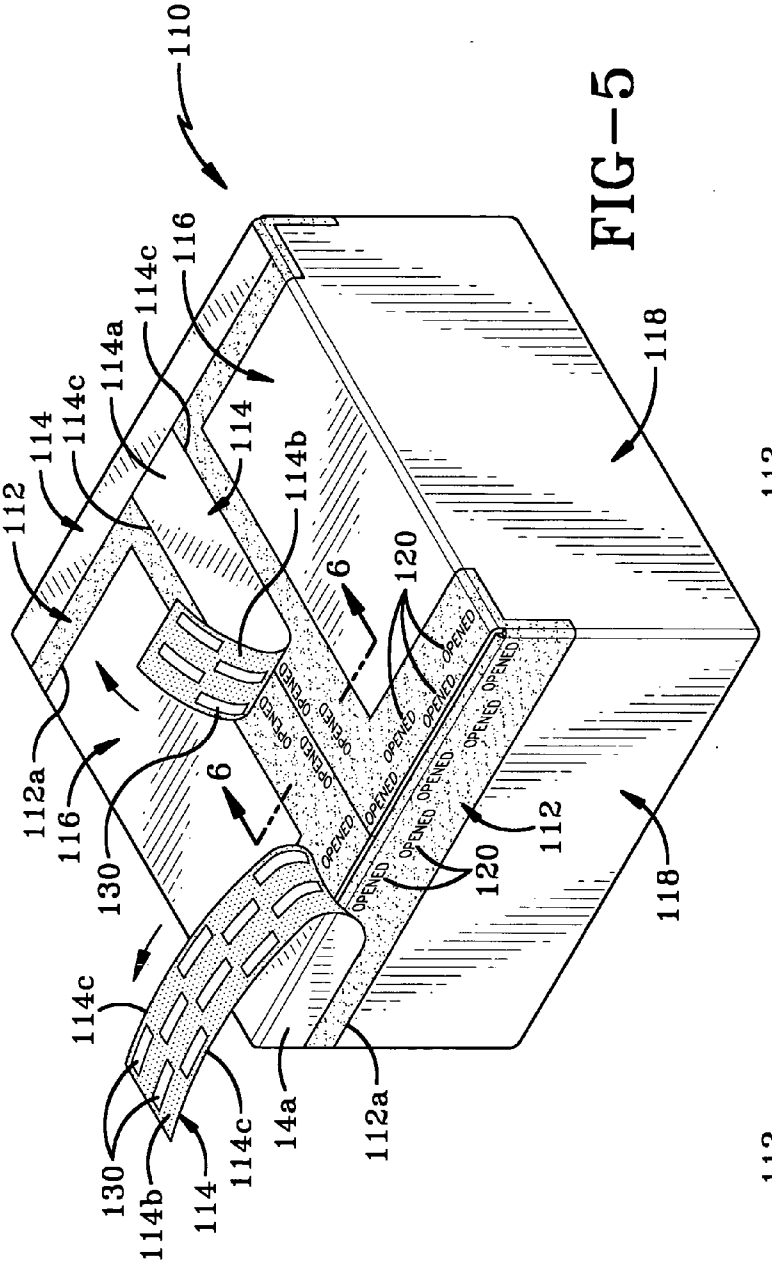

110
116
114c
114a
114
112
114c
114
114b
112a
116
130
6
6
120
OPENED
118
112
120
112a
114c
130
114b
114
114c
14a
112a

FIG-5

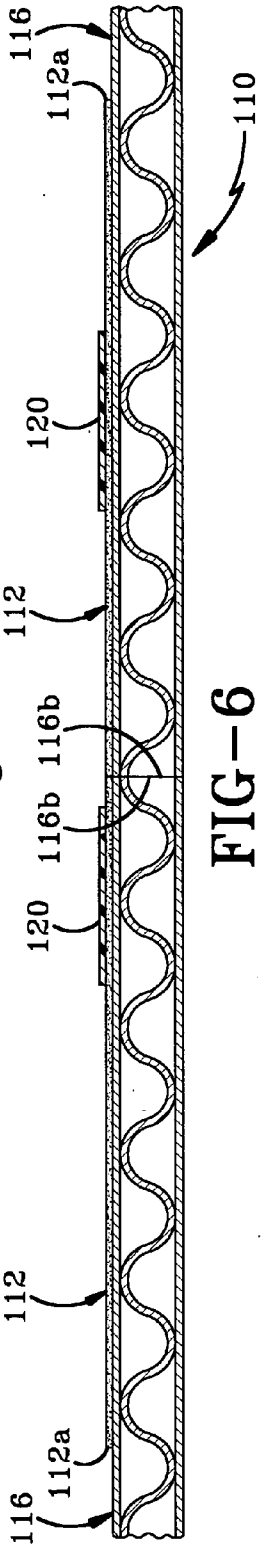

116
112a
110
120
112
116b
116b
120
112
112a
116

FIG-6

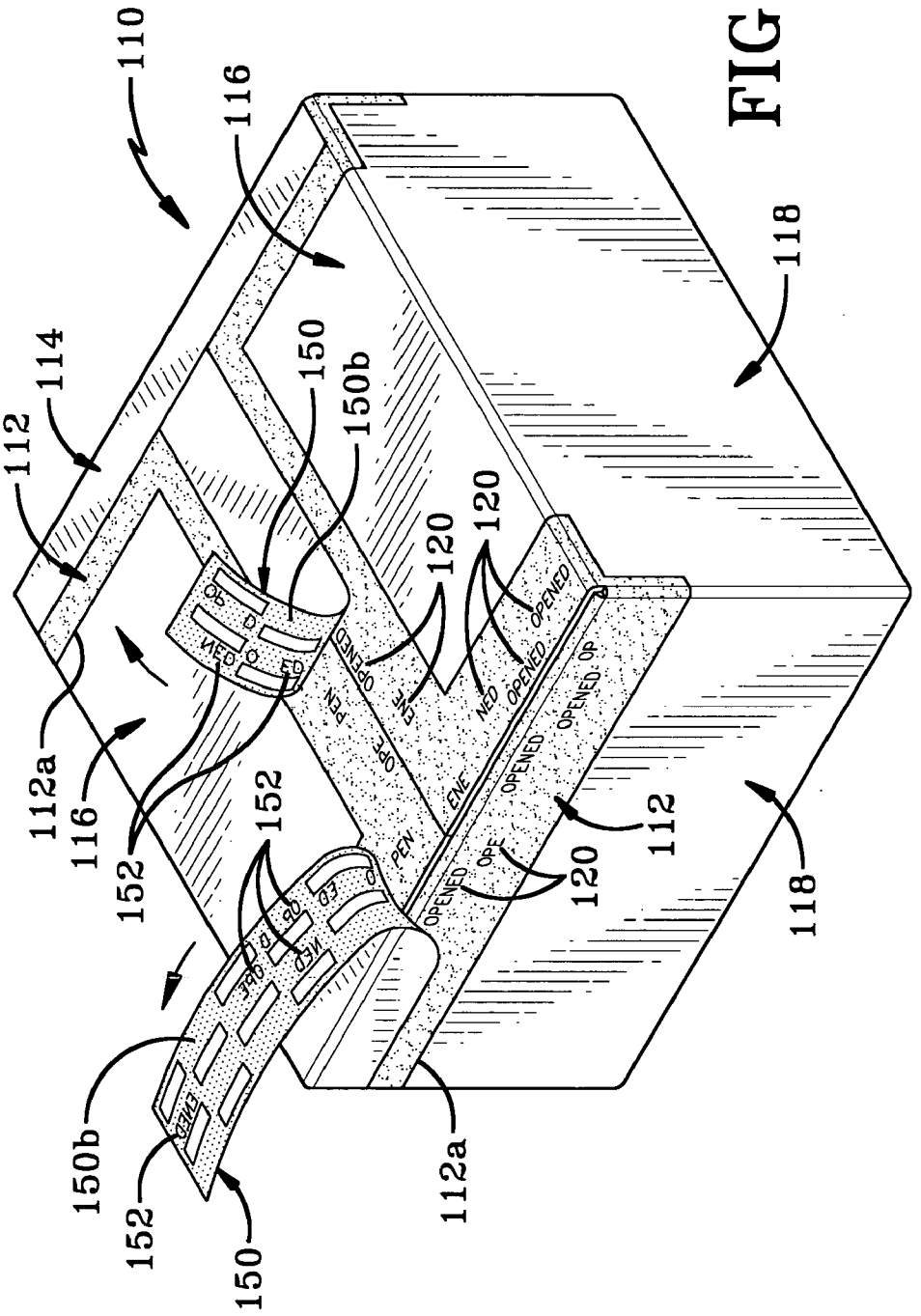
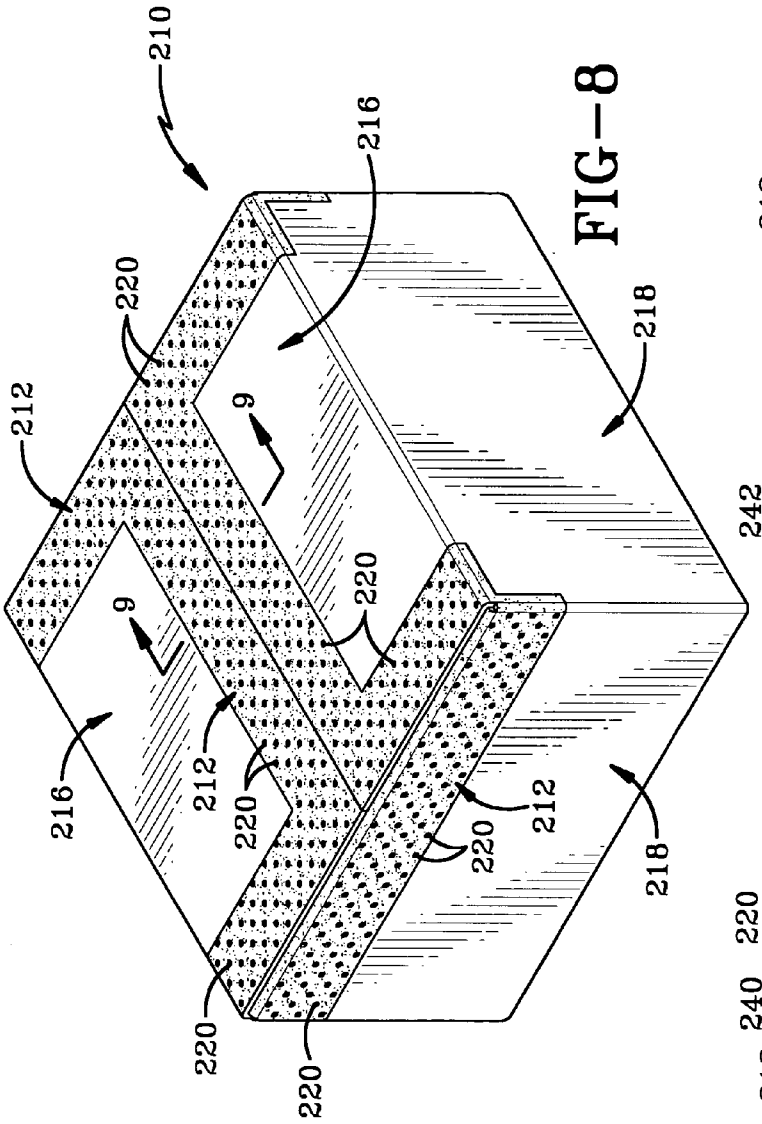


FIG-7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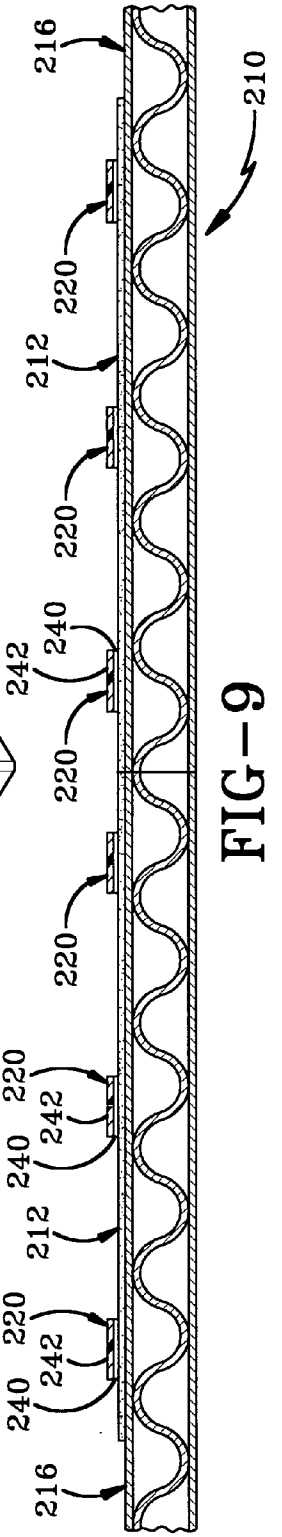
216
220
212
218
9
9
216
212
220
220
220
212
220
218
220

FIG-8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210
220
212
220
240
242
220
220
220
240
242
212
220
240
242
216

FIG-9

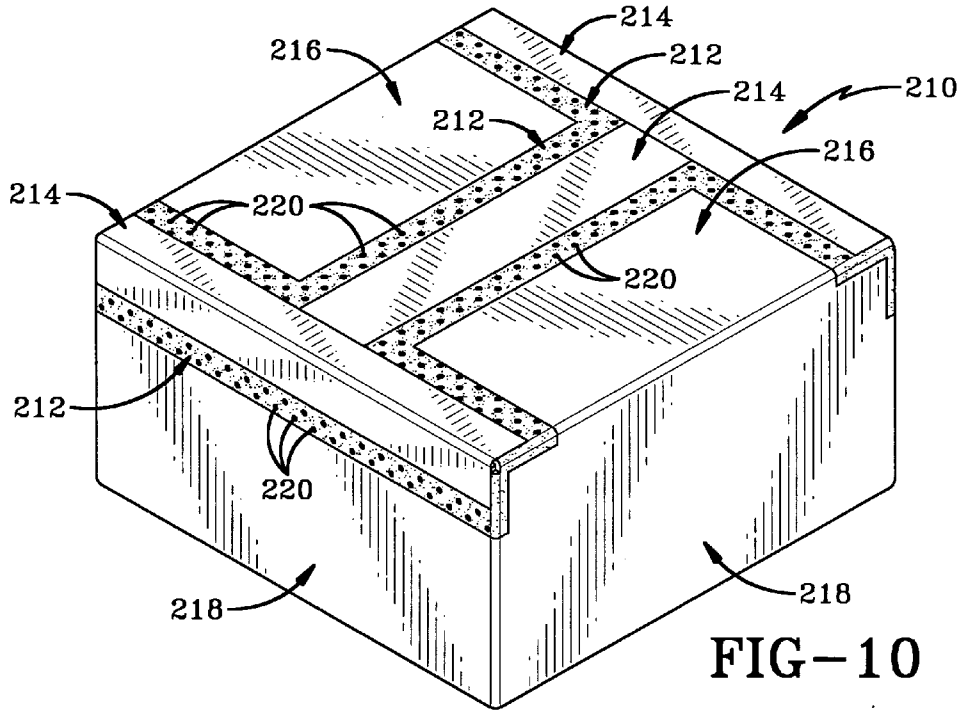

214
216
212
214
210
212
216
214
220
220
212
220
218
218

FIG-10

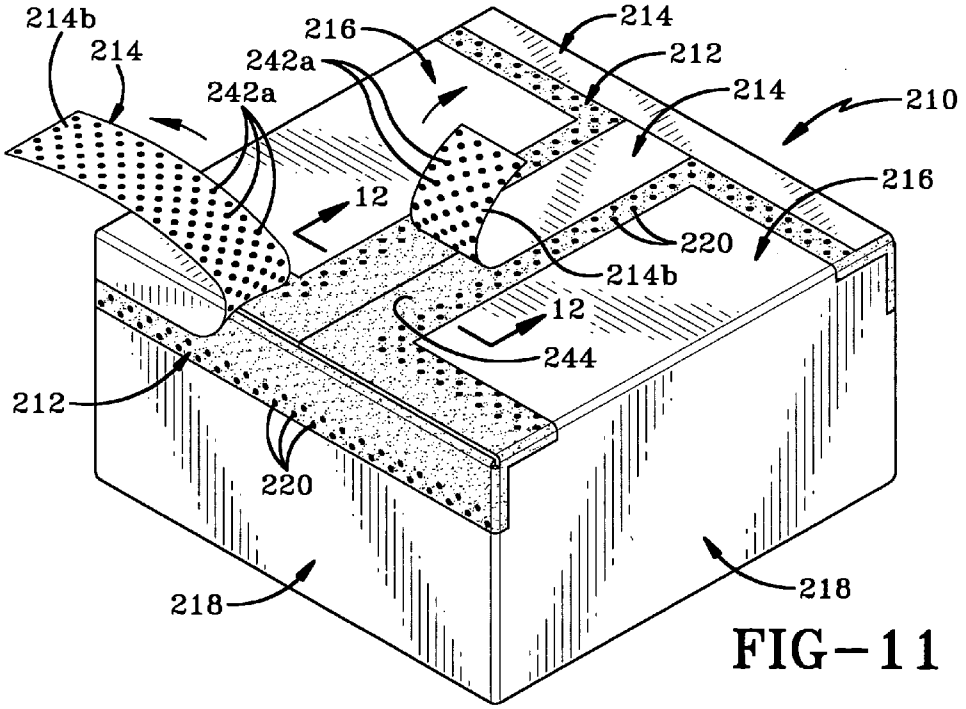

214b
214
216
214
242a
212
242a
214
210
12
216
220
214b
12
244
212
220
218
218

FIG-11

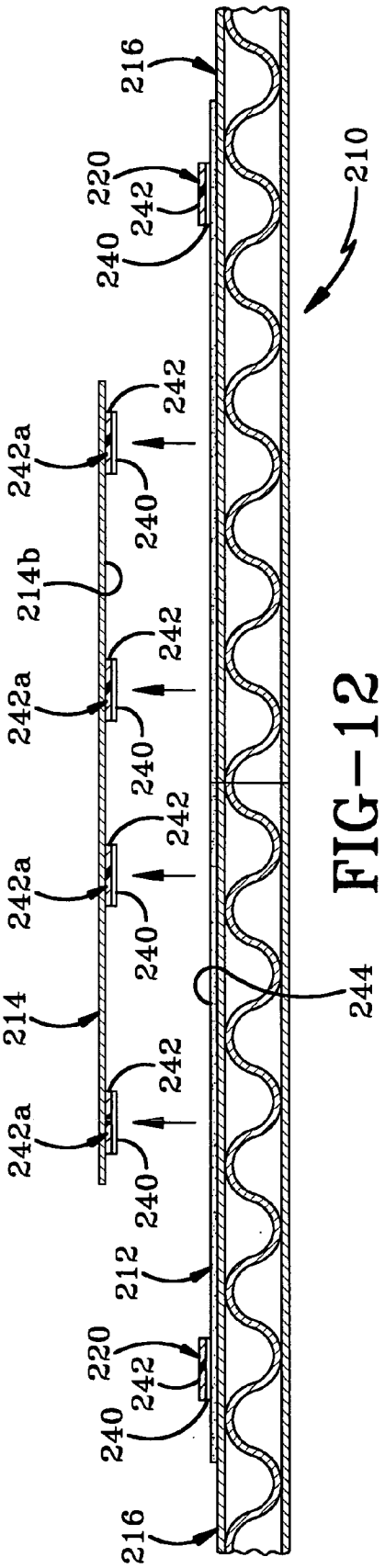

216
220
242
240
210
242
242a
240
214b
242
242a
240
242
242a
240
214
242
242a
240
244
212
220
242
240
216

FIG-12

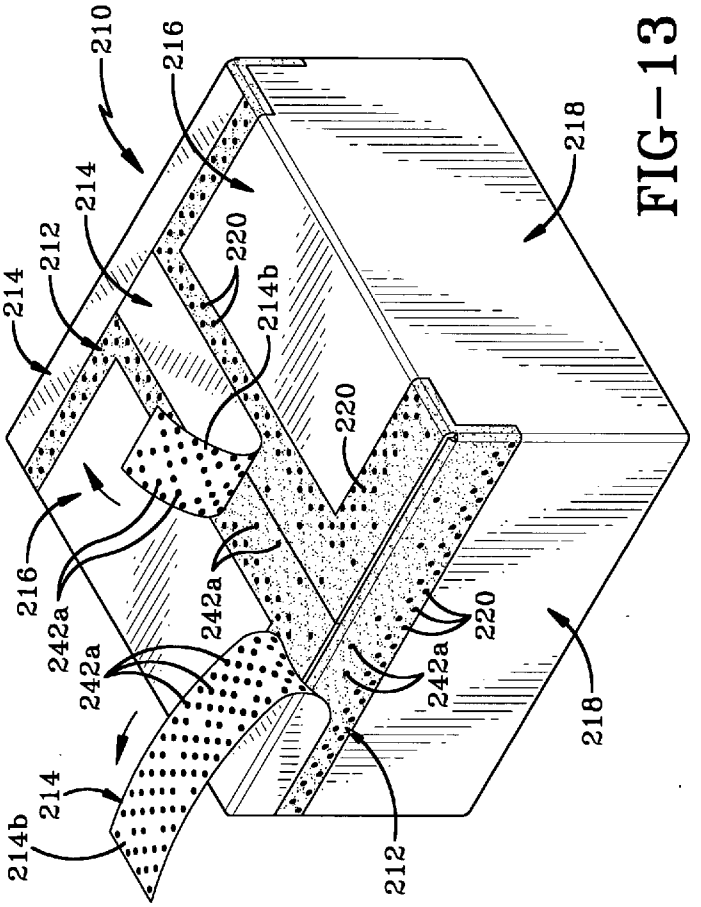

210
216
214
212
214
220
214b
218
220
216
242a
242a
242a
242a
220
218
214b
214
212

FIG-13

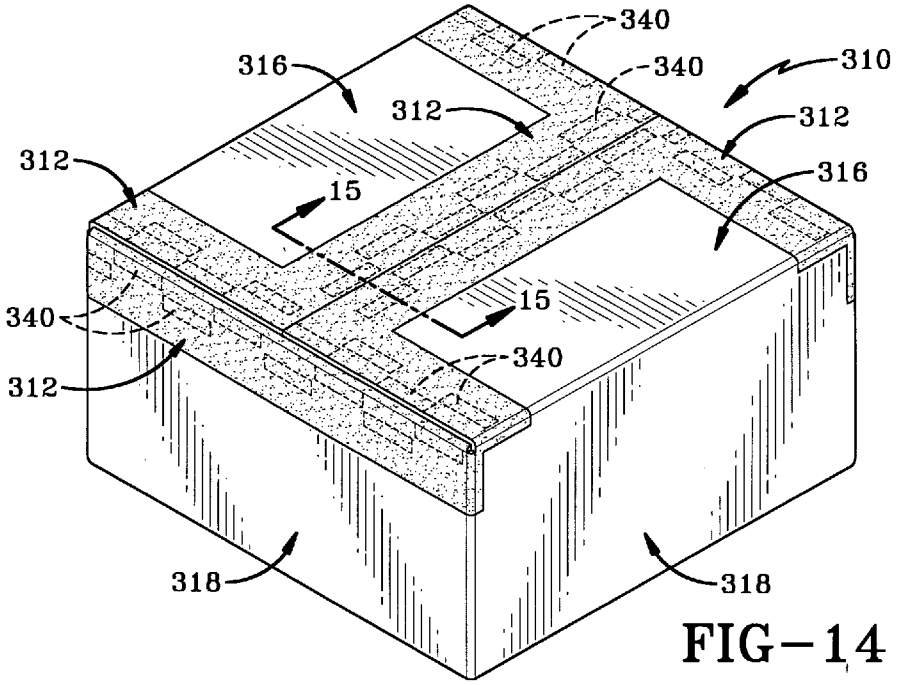
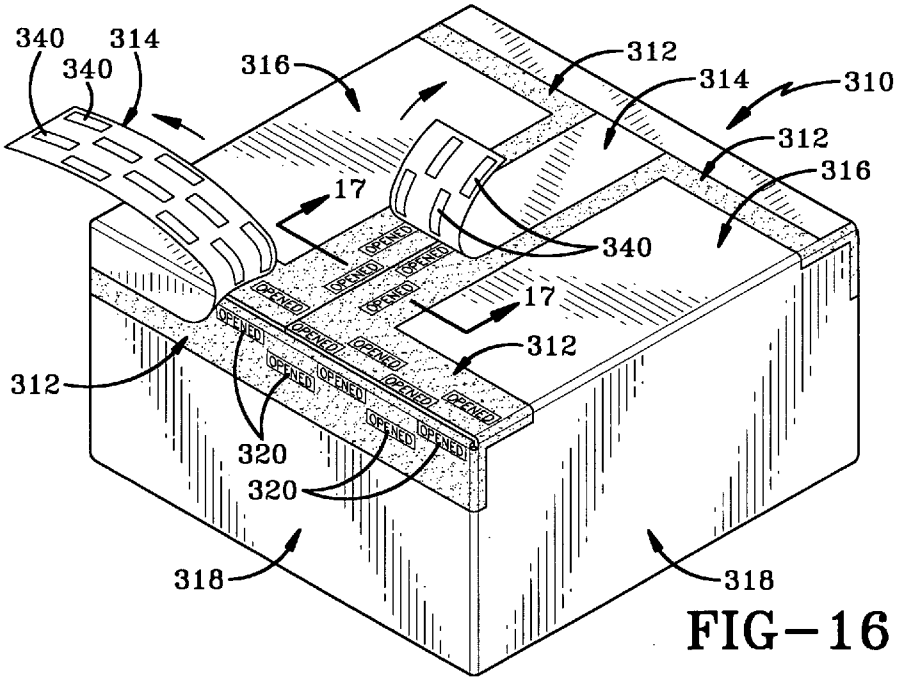

340
316
340
310
312
312
312
316
15
15
340
340
312
318
318

FIG-14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314
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316
312
314
310
312
316
17
340
17
312
312
320
320
318
318

FIG-16

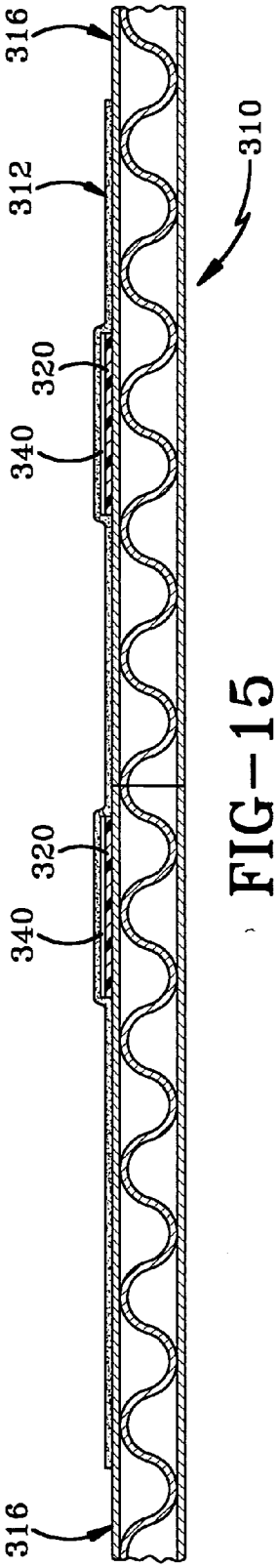
316
312
310
320
340
320
340
316

FIG-15

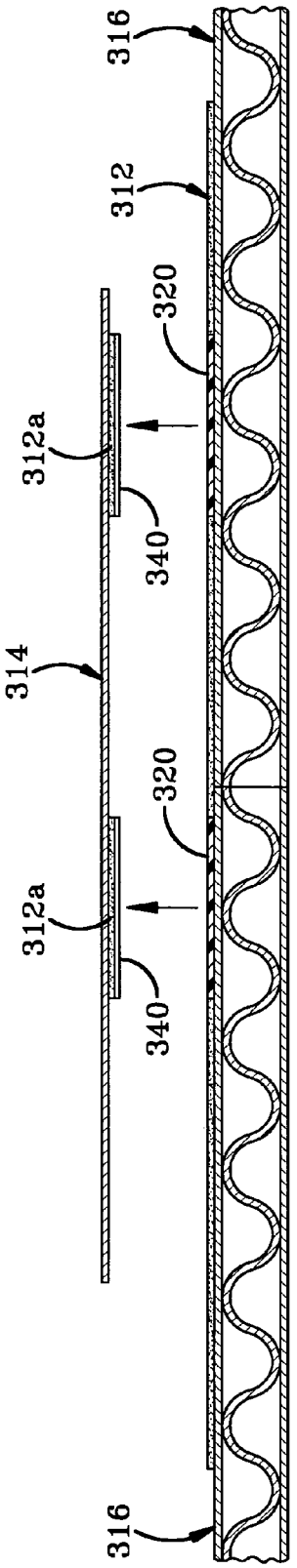
316
312
310
320
312a
340
314
320
312a
340
316

FIG-17

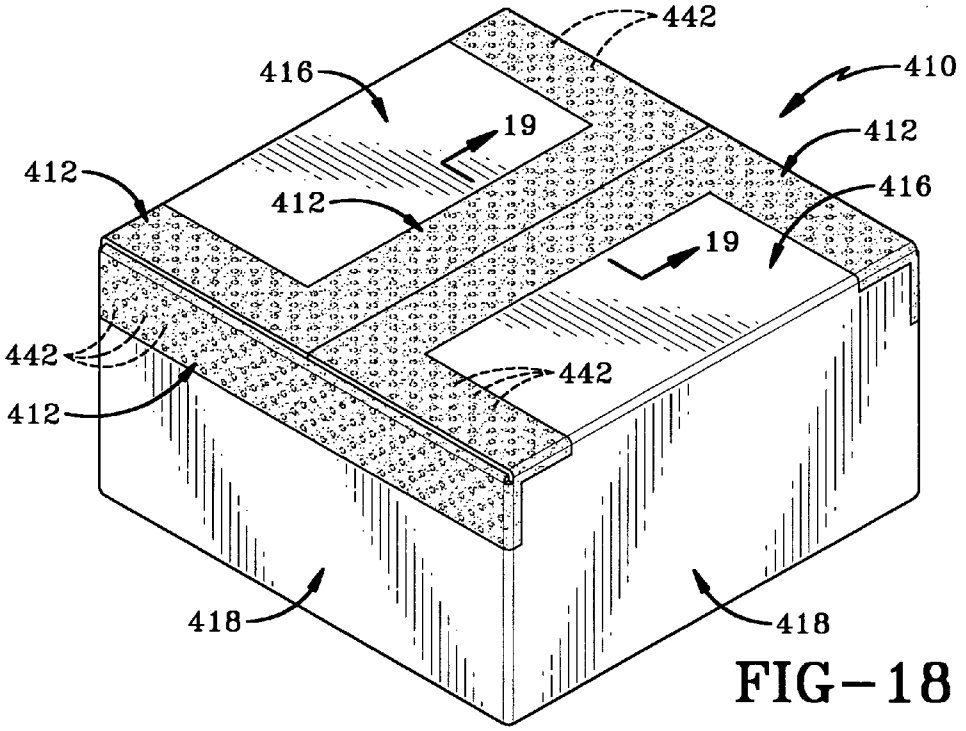
442
416
410
19
412
412
412
416
19
442
442
412
418
418

FIG-18

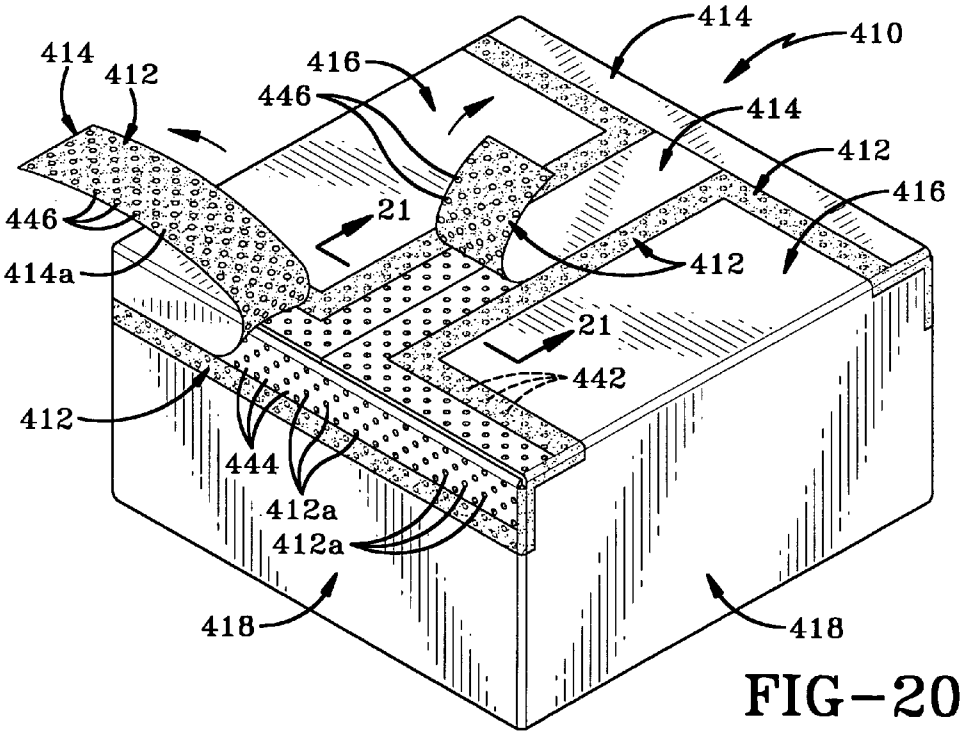
414
414
412
410
416
446
414
412
416
446
21
414a
412
21
442
412
444
412a
412a
418
418

FIG-20

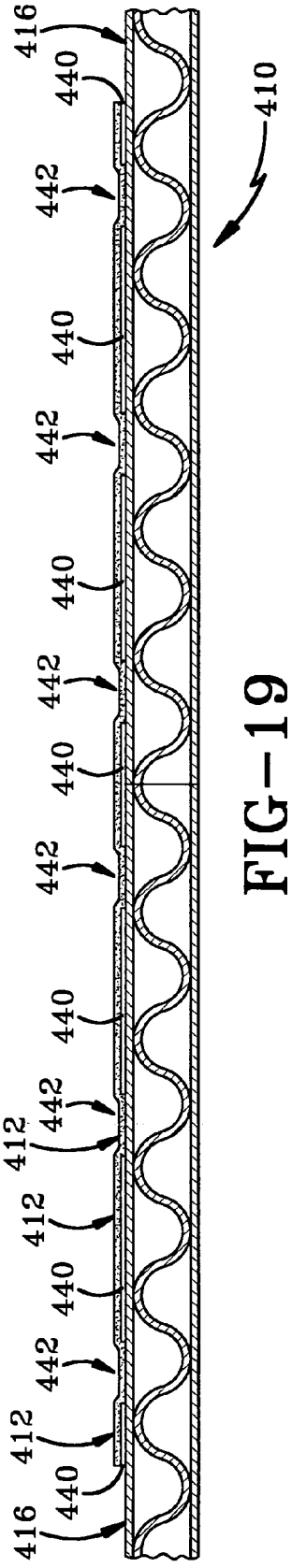

FIG-19

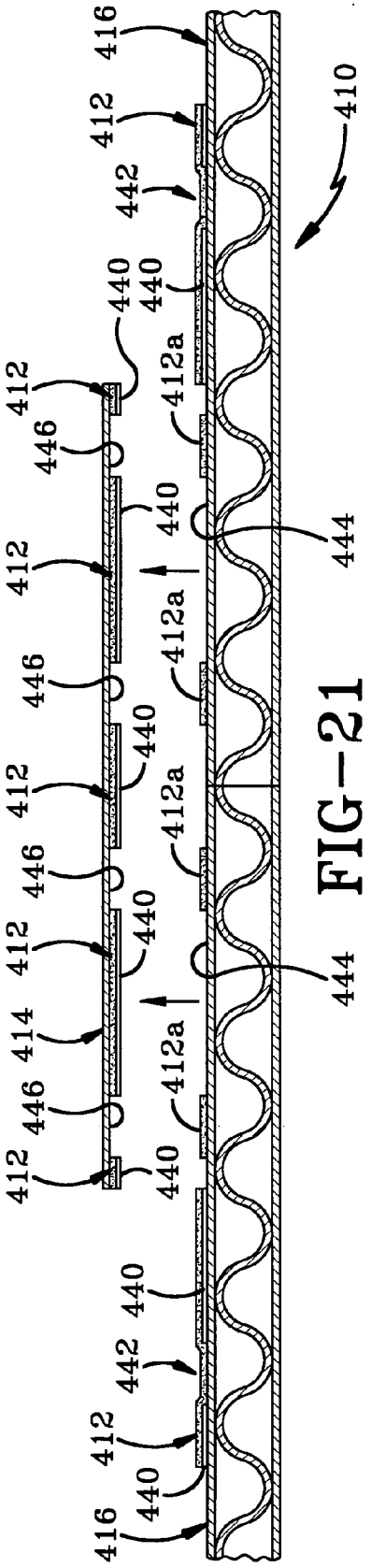

FIG-21

SECURITY PACKAGING WITH POST RECYCLED CONTENT

BACKGROUND OF THE INVENTION

[0001] 1. Technical Field

[0002] This invention generally relates to packaging materials. More particularly, the invention relates to a packaging box. Specifically, the invention relates to a packaging box which is manufactured using a high content of post recycled materials, which includes a finish that enables packaging tape to adhere more easily thereto and which preferably includes security indicators to show if the package has been previously opened.

[0003] 2. Background Information

[0004] Every year millions of parcels and packages are transported around the world both by regular postal authorities, by mailing companies and couriers. Companies that regularly ship goods in this manner can spend a lot of money on the packaging boxes themselves. There has therefore been a move in the industry to use boxes which include a higher post recycled material content in order to lower the costs involved. Such boxes are suitable for shipping products but they do, however, have a disadvantage in relation to boxes produced with little or no post recycled content materials. Corrugated cardboard produced with post recycled material tends to have a greater number of fibers that project outwardly from its surfaces. These fibers can interfere with packaging tape sticking effectively to the outer surface of the box. This can cause two problems. Firstly, the package may pop open during shipping because the tape has disengaged from the cardboard. Secondly, the tape can be easily removed and replaced by unauthorized persons without the recipient of the package ever becoming aware of this tampering until the goods inside the box are examined.

[0005] There is therefore a need in the art for high post recycled content packaging boxes to which packaging tape may more easily and firmly adhere. There is a further need in the art for a packaging box which can be more easily identified as having been opened by an unauthorized person.

SUMMARY OF THE INVENTION

[0006] The device of the present invention comprises a cardboard packaging box to which a band of lacquer has been applied in those areas of the box that would typically receive packaging tape thereon. The box is manufactured from a high post recycled content material. The lacquer band provides a suitable surface to which packaging tape will more easily adhere. Security indicators can be applied to either the lacquer layer of the box or the packaging tape to indicate to a recipient that the box has been previously opened. A layer of release agent is applied either directly to the box, or above the lacquer layer so that when packaging tape is pulled off the box, the security indicators are revealed. The lacquer layer and/or the security indicators preferably are colored to draw the recipient's attention thereto.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] 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.

[0008] **FIG. 1** is a perspective view of a first embodiment of a packaging box in accordance with the present invention and showing the applied lacquer layer;

[0009] **FIG. 2** is cross-sectional front view through line **2-2** of **FIG. 1**;

[0010] **FIG. 3** is a perspective view of the packaging box with packaging tape applied over the lacquer layer and sealing the box;

[0011] **FIG. 4** is a cross-sectional front view through line **4-4** of **FIG. 3**;

[0012] **FIG. 5** is a perspective view of the packaging box of **FIG. 1** used in conjunction with a security packaging tape;

[0013] **FIG. 6** is a cross-sectional front view through line **6-6** of **FIG. 5**;

[0014] **FIG. 7** is a perspective view of a packaging box which has been tampered with showing the appearance of damaged security indicators on the lacquer band;

[0015] **FIG. 8** is a perspective view of a second embodiment of packaging box in accordance with the present invention and showing a plurality of security indicators deposited on the lacquer layer;

[0016] **FIG. 9** is a cross-sectional front view through line **9-9** of **FIG. 8**;

[0017] **FIG. 10** is a perspective view of the packaging box of **FIG. 8** with packaging tape applied over the lacquer layer;

[0018] **FIG. 11** is a perspective view of the packaging box with the packaging tape partially removed therefrom and showing the security indicators being transferred to the underside of the packaging tape;

[0019] **FIG. 12** is a cross-sectional front view through line **12-12** of **FIG. 11** showing the packaging tape partially removed from the box and showing the security indicators transferred to the packaging tape;

[0020] **FIG. 13** is a perspective view of the packaging box that has been tampered with and showing the damaged security indicators;

[0021] **FIG. 14** is a perspective view of a third embodiment of packaging box showing the lacquer layer and layer of release agent areas in phantom;

[0022] **FIG. 15** is a partial cross-sectional front view through line **15-15** of **FIG. 14**;

[0023] **FIG. 16** is a perspective view of the packaging box of **FIG. 14** showing packaging tape being removed therefrom;

[0024] **FIG. 17** is a partial cross-sectional front view through line **17-17** of **FIG. 16**;

[0025] **FIG. 18** is a perspective view of a fourth-embodiment of packaging box in accordance with the present invention and showing the laquer layer with areas where a release agent has not been applied shown in phantom;

[0026] **FIG. 19** is a partial cross-sectional front view through line **19-19** of **FIG. 18**;

[0027] **FIG. 20** is a perspective view of the packaging box of **FIG. 18** having packaging tape removed therefrom; and

[0028] **FIG. 21** is a partial cross-sectional front view of the packaging box through line **21-21** of **FIG. 20**.

DETAILED DESCRIPTION OF THE INVENTION

[0029] Referring to **FIGS. 1-4**, there is shown a first embodiment of a packaging box in accordance with the present invention and generally indicated at **10**. Box **10** is made from a corrugated cardboard and preferably from a cardboard which has a high post recycled material content. Box **10** includes a bottom wall (not shown); peripheral side walls **18** extending outwardly away from the bottom wall and a pair of upper flaps **16** that can be rotated between an open and closed position. The bottom wall, side walls **18** and flaps **16** form an interior cavity into which articles to be shipped can be placed.

[0030] In accordance with one of the specific features of the present invention, a lacquer layer **12** is applied to those areas of box **10** onto which packaging tape **14** will later be applied. These areas include an area proximate the sides **16***a* and edges **16***b* of flaps **16** and the upper edges **18***a* of the sides **18** of box **10**. Lacquer layer **12** comprises any type of lacquer that will allow packaging tape **14** to adhere thereto. Lacquer layer **12** preferably is applied in a band that is between ½ inch and 2 inches wide. The width of the band allows for the application of a variety of widths of tape **14**. Lacquer layer **12** preferably is sufficiently wide enough to prevent tape **14** from coming into direct contact with the outer surface of box **10**. This prevents any upstanding fibers from the post recycled materials from interfering with the adhesion of tape **14**. Lacquer layer **12** enables packaging tape **14** to more easily adhere to the outer surface of box **10** and to therefore seal the same. Lacquer layer **12** may be colored so that the user can more easily see where the tape **14** should be applied.

[0031] The packaging tape **14** has an upper surface **14***a*, a lower surface **14***b* and side edges **14***c*. Lower surface **14***b* includes an adhesive layer that bonds tape **14** to lacquer layer **12**. Tape **14** is applied so that it covers an area of the flaps **16** proximate the edges **16***b*, **16***b* and seals the box **10**. Similarly, tape **14** may be partially applied to an area of the sides **18** of the box **10** proximate the upper edge **18***a* thereof and partially applied to an area proximate the sides **16***a* of box **10**.

[0032] The present invention is used in the following manner. A lacquer layer **12** is applied to the above-identified areas of box **10** by way of a spray or roller applicator. Lacquer layer **12** is allowed to dry.

[0033] When the lacquered box **10** is purchased by the user, the user places the items to be shipped into the interior cavity (not shown) of box **10**. Flaps **16** are rotated from an open position to a closed position where access to the interior cavity is prevented (**FIG. 1**). In this closed position, edges **16***b* of flaps **16** lie in close proximity to each other. Tape **14** is applied over lacquer layer **12** in any desired configuration, such as that shown in **FIG. 2**. Tape **14** preferably is applied so that, side edges **14***c* of tape **14** lie inwardly of edges **12***a* of lacquer layer **12**. This prevents direct contact between lower surface **14***b* of tape **14** and un-lacquered areas of box **10**. When box **10** is sealed, it can be shipped to its destination. Upon arrival of box **10** at its destination, tape **14** is simply pulled off lacquer layer **12** and the contents of box **10** can be accessed.

[0034] As is shown in **FIGS. 5-7**, box **10** may alternatively be sealed with a packaging tape **114** that includes a plurality of security indicators **120** thereon. In this instance, all the features of box **110** are substantially the same as those of box **10**, including the provision of a lacquer layer **112** applied in a band proximate the sides and edges of flaps **116** and sides **118**. Lower surface **114***b* of tape **114** includes a plurality of areas positioned at spaced intervals along the length of tape **114**. These areas are coated with a release agent (not shown). A security indicator **120** is imprinted onto each area coated in release agent in one of an ink and paint. The ink or paint preferably is of a bright, eye-catching color such a fire-engine red, bright yellow or hot pink. Lower surface **14***b* of tape **114**, including security indicators **120**, is then coated with an adhesive layer (not shown). Security indicators **120** may include words like "OPENED" which may be colored for impact, or colored bars or any other shaped and colored identifiers that could indicate to the recipient that the box **110** has been tampered with. If box **110** is opened by an unauthorized user and then resealed, portions of indicators **120** that have been deposited onto lacquer layer **112** may be removed by the adhesive on packaging tape **114**. When box **110** reaches its destination and is opened, those parts of indicators **120** which were removed from lacquer layer **112** show up on lower surface **114***b* of tape **114** as partial indicators **152**. The presence of these partial indicators **152** show the recipient that box **110** was previously opened. Furthermore, the security indicators **120** on box **110** have portions that are missing—so, for instance in the case of indicators **120** being words, some of the letters of the words are missing on lacquer layer **112** and those missing letters appear on tape **114** as indicators **152**.

[0035] Referring to **FIGS. 8-13** there is shown a second embodiment of packaging box in accordance with the present invention and generally indicated at **210**. As before, box **210** includes a lacquer layer **212** disposed in bands proximate the edges of flaps **216** and sides **218** of box **210**. In accordance with one of the specific features of this embodiment, a plurality of security indicators **220** is formed at spaced intervals along the bands of lacquer layer **212**. Each security indicator **220** includes a layer of release agent **240** and a colored indicator layer **242** (**FIG. 9**). Layer of release agent **240** is deposited directly onto lacquer layer **212** and indicator layer **242** is deposited directly over layer of release agent **240**. Indicator layer **242** comprises an ink or paint, preferably of a bright eye-catching color, such as fire-engine red, bright yellow or hot pink. As can be seen in **FIG. 8**, security indicators **220** are formed on lacquer layer **212** in a distinct pattern and preferably cover the entire length and width of the band of lacquer. Any suitable pattern of indicators can be used without departing from the sprit of the present invention.

[0036] Referring to **FIGS. 10 and 11**, box **210** is used in the following manner. Packaging tape **214** is placed over lacquer layer **212** to seal the edges of flaps **216** and sides **218**. Side edges **214***b* of tape **214** lie inwardly of the side edges **212***b* of lacquer layer **212**. The adhesive on lower

surface **214***b* of tape **214** adheres to both the indicator layer **242** of all security indicators **220** disposed beneath tape **214** and to those regions of lacquer layer **212** interposed between security indicators **220**. When tape **214** is pulled away from box **210**, indicator layers **242** of those security indicators **220** disposed beneath tape **214** are pulled off box **210**. This is the result of the presence of the layer of release agent **240** disposed between the indicator layer **242** and lacquer layer **212**. The removed indicator layers **242***a* remain stuck to the lower surface **214***b* of tape **214** as is shown in **FIG. 11**. Furthermore, the removal of indicator layers **242***a* from box **210** forms a band **244** on lacquer layer **212** in which there aren't any security indicators. Band **244** is of the same width as packaging tape **214**. If the box **210** has not been previously opened, it will be immediately obvious to the recipient because there will be a uniform pattern of indicator layers **242***a* transferred onto the lower surface **214***b* of tape **214**. Furthermore, there will be a band **244** formed in the interior of lacquer layer **212** where security indicators **220** have been removed. If box **210** has been tampered with, the pattern of paint layers **242***a* on lower surface **214***b* and the pattern of security indicators **220** will be disturbed. It is unlikely that any removed tape **214** could be replaced in exactly the correct position over the lacquer layer **212**. Misaligning the tape **214** would likely lead to the removal of additional indicator layers **242** from lacquer layer **212** and would break the pattern formed by security indicators on both the box **210** and on the lower surface **214***b* of tape **214**. Furthermore, misaligned tape could also lead to the redeposit of some of the paint layers **242***a* onto the lacquer layer **212** in any area where remnants of the adhesive from tape **214** have remained on lacquer layer **212**. **FIG. 13** is an illustration of a box **210** which may be have been tampered with, showing a break in the pattern on both the lacquer layer **212** and on the tape **214**. It will be understood that while the security indicators **220** in **FIGS. 8-13** have been shown as dots, they can be formed in any other shapes or may be in the form of words or any other suitable identifiers.

[**0037**] Referring to **FIGS. 14-17** there is shown a third embodiment of packaging box in accordance with the present invention and generally indicated at **310**. In box **310**, a plurality of security indicators **320** are printed directly onto the outer surface of box **310** in an area proximate the edges of flaps **316** and sides **318**. A small area covering and surrounding each security indicator **320** has a layer of release agent **340** applied directly thereover. A colored lacquer layer **312** is then applied in a band proximate the edges of flaps **316** and sides **318** of box **310** and covering the areas with a layer of release agent **340** applied thereto. The lacquer layer **312** makes it impossible to see security indicators **320**.

[**0038**] In use, packaging tape **314** is used to close and secure flaps **316** together and to secure flaps **316** to sides **318**. When packaging tape **314** is removed at the box's destination, the layer of release agent **340** and small areas **312***a* of lacquer layer **312** break free from the band of lacquer and remain adhered to tape **314**. The removal of layer of release agent **340** and areas **312***a* makes security indicators **320** visible. If an authorized user attempts to reseal box **310**, either with the original packaging tape **314**, or with other tape, that tape will adhere to the outer surface of box **310** and when the tape is later removed, the security indicators **320** and the outer surface of the box will be damaged. This will show the recipient of the packaging box **310** that the box has been tampered with.

[**0039**] Referring to **FIGS. 18-21**, there is shown a fourth embodiment of packaging box in accordance with the present invention and generally indicated at **410**. A layer of release agent **440** is applied in a band to the outer surface of box **410**. A plurality of areas **442** are interspersed at spaced intervals throughout the band of layer of release agent **440** where no release agent is applied. A colored lacquer layer **412** is applied in a band over the layer of release agent **440** and areas **442**. This means that in areas **442**, the lacquer is applied directly to the outer surface of box **410** as can be seen in **FIG. 19**. When packaging tape **414** is removed from box **410**, tape **414** pulls the lacquer layer **412** off box **410** everywhere except in those areas **442** where no release agent **440** was applied. The remnants of the lacquer layer form small colored dots **412***a* all over those portions of box **410** where no release agent was applied. The inner surface **414***a* of packaging tape is covered with lacquer layer **412** but includes a plurality of holes **446** therein where the lacquer remained on box **410** as dots **412***a*.

[**0040**] It will be understood by those skilled in the art that while the lacquer layer has been disclosed as being applied to a cardboard box manufactured from high post recycled content, the lacquer layer may be applied to cardboard boxes that have little or no post recycled material content without departing from the scope of the present invention. Furthermore, while the box illustrated in the attached drawings has been shown as having two rotatable flaps, any other style of cardboard box can have a lacquer layer applied thereto in a position where packaging tape could be applied to seal the box. People skilled in the art will also appreciate that the security indicators can be applied anywhere along the width and length of the lacquer layer and/or packaging tape and that the identifiers may be applied in discrete bands or may be spread along the entire width and length of the two components.

[**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 is an example and the invention is not limited to the exact details shown or described.

1. A packaging box for transporting products, said box comprising:

a cardboard box formed from post recycled materials; said box having at least two walls with outer edges which abut each other, wherein at least one of the walls is movable to obtain access to an interior cavity within the box; and wherein each wall has an outer surface;

a lacquer layer applied to a portion of the outer surface of each wall proximate the outer edge thereof

2. The packaging box as defined in claim 2, wherein the lacquer layer is applied to the outer surface in a band that is between ½ inch and 2 inches wide.

3. The packaging box as defined in claim 2, wherein the lacquer layer is colored.

4. The packaging box as defined in claim 2, further comprising a layer of release agent applied to the box at one of below and above the lacquer layer.

5. The packaging box as defined in claim 4, wherein the layer of release agent is applied at a plurality of spaced apart discrete areas.

6. The packaging box as defined in claim 5, wherein the discrete areas of the layer of release agent are arranged in a pattern.

7. The packaging box as defined in claim 6, further comprising a plurality of security indicators applied to the box proximate the outer edges of the walls.

8. The packaging box as defined in claim 7, wherein the security indicators are applied directly to the outer surface of one of the walls of the box.

9. The packaging box as defined in claim 8, wherein the security indicators are applied over the lacquer layer on the box.

10. The packaging box as defined in claim 8, wherein the security indicators are applied over the layer of release agent on the box.

11. The packaging box as defined in claim 10, wherein the lacquer layer is colored.

12. The packaging box as defined in claim 11, wherein the security indicators are colored.

13. The packaging box as defined in claim 11, wherein the security indicator is formed as one of a word and a shape.

14. In combination:

a post recycled content cardboard box having at least one wall that is moveable over an interior cavity;

a lacquer layer applied proximate an outer edge of the at least one wall;

a packaging tape applied over the lacquer layer to prevent movement of the one wall to seal the box and prevent access to the interior cavity.

15. The combination as defined in claim 14, wherein the lacquer layer is applied in a band extending substantially parallel to the outer edge of the at least one wall; and wherein said band is between ½ inch and 2 inches wide.

16. The combination as defined in claim 15, further comprising a layer of release agent applied to one of above and below the lacquer layer.

17. The combination as defined in claim 16, wherein the layer of release agent is applied at discrete intervals at one of above and below the laquer layer.

18. The combination as defined in claim 17, further comprising a plurality of security indicators applied to one of an outer surface the wall, above the lacquer layer and above the layer of release agent.

19. The combination as defined in claim 18, wherein one of the lacquer layer and security indicators is colored.

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