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(54) **PACKAGING CONTAINER FOR TEST SENSORS**

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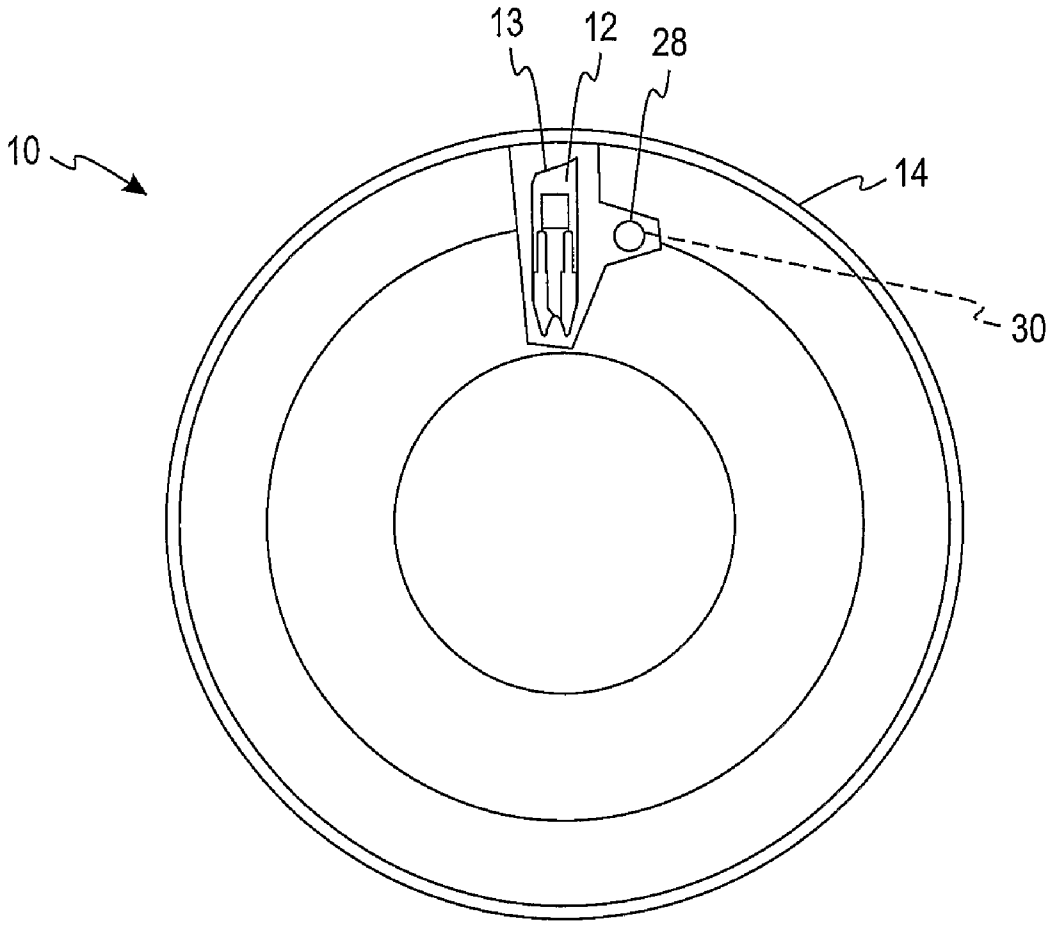
(52) **U.S. Cl.** ..... **206/305**; 206/722; 206/725

(57) **ABSTRACT**

A test sensor packaging container for use in a sensor instrument. The container comprises a housing, a first foil cover, and a second foil cover The housing has first and second housing layers. The first housing layer has a first plurality of test sensor containing regions. The second housing layer has a second plurality of test sensor containing regions. Each of the first and second plurality of test sensor containing regions protrude radially outward from the center of the housing. The housing has a top portion and a bottom portion that are generally parallel. Each of the test sensors has width and thickness directions. The first foil cover is adapted to cover the top portion of the first housing layer The second foil cover is adapted to cover the bottom portion of the second housing layer.



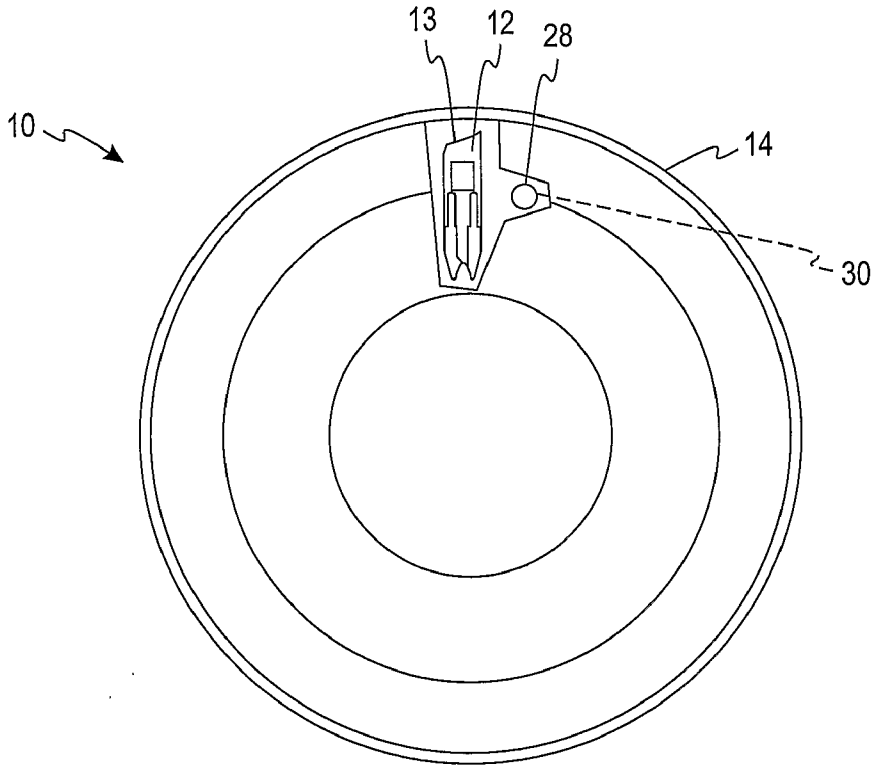



*Fig. 1*

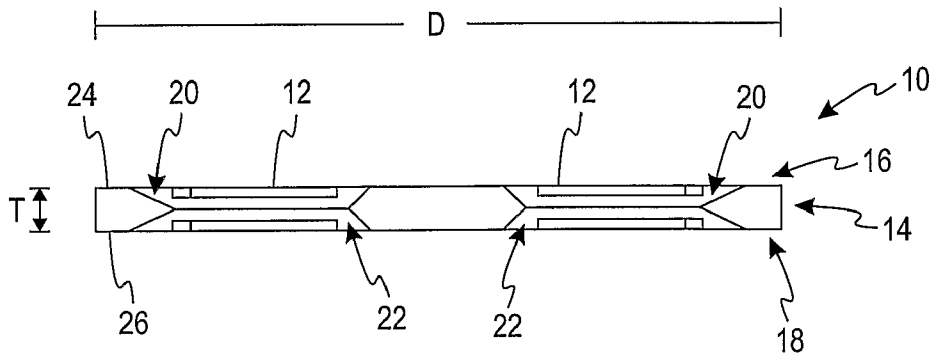



*Fig. 2*

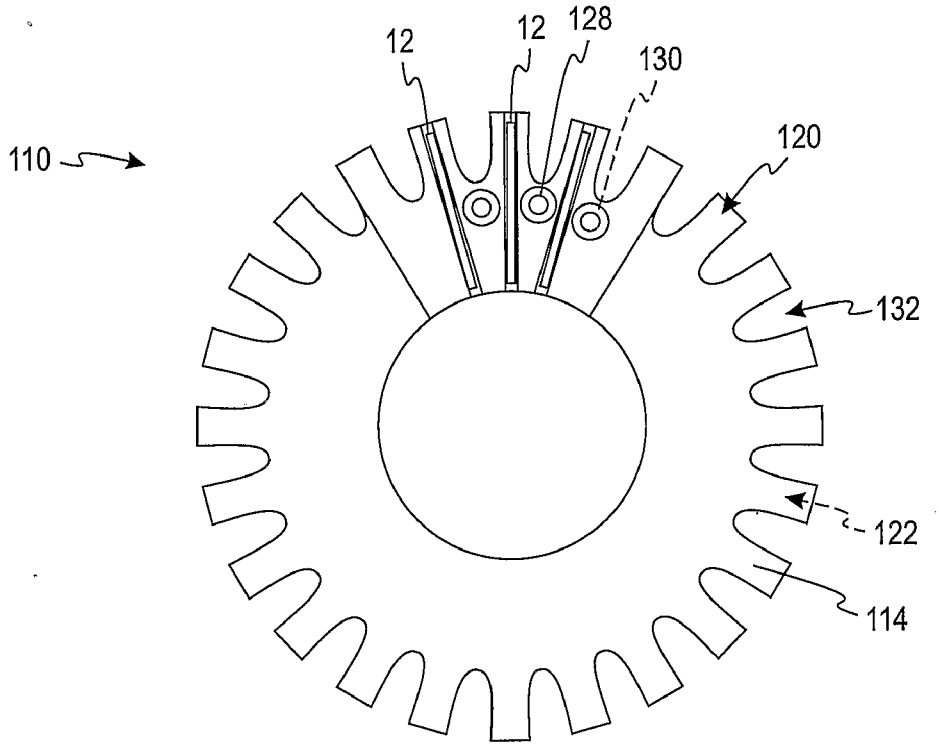

12
12
128
130
110
120
132
122
114

*Fig. 3*

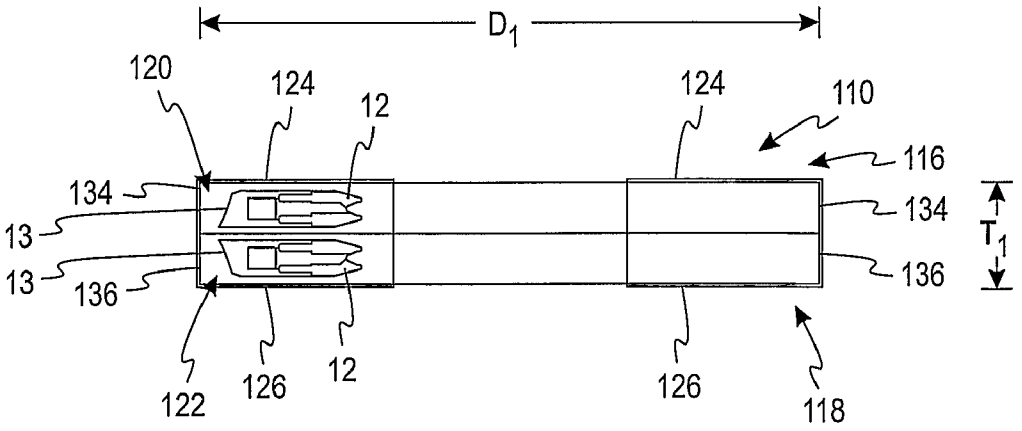

$D_1$
120
124
12
124
110
116
134
134
13
13
136
136
$T_1$
122
126
12
126
118

*Fig. 4*

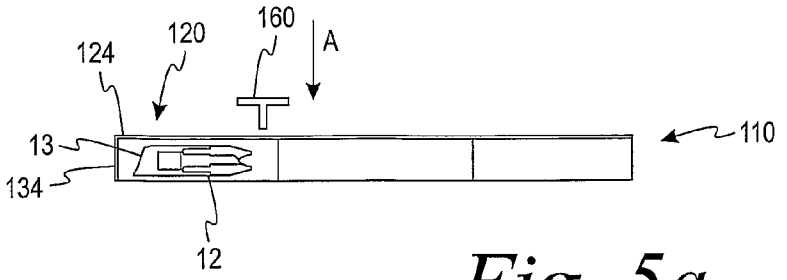



Fig. 5a

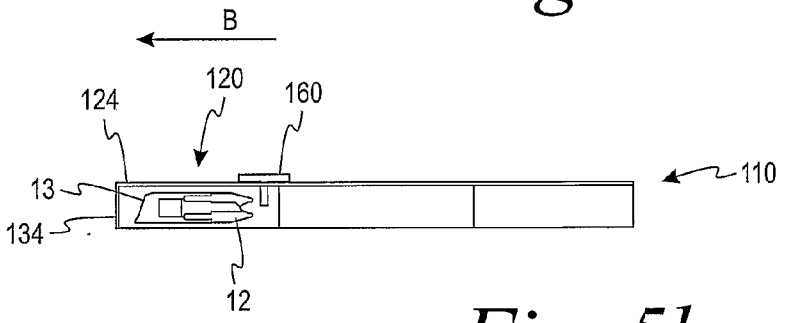



Fig. 5b

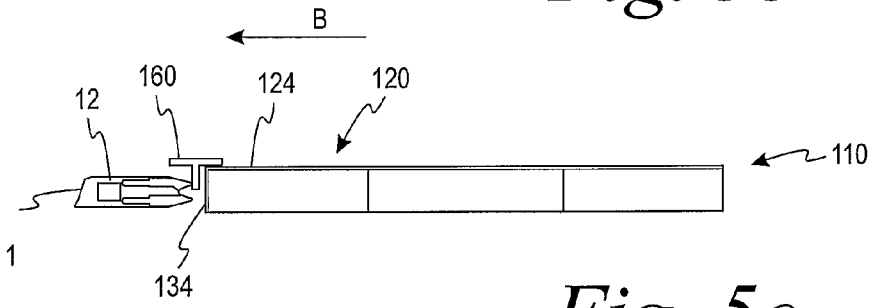



Fig. 5c

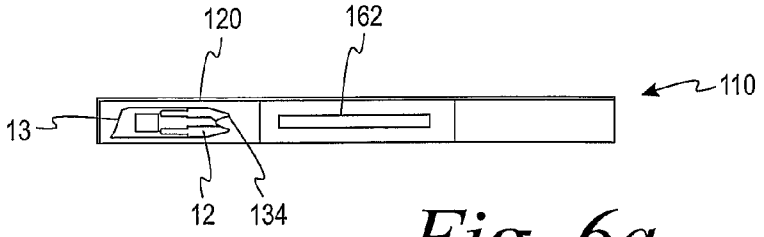



Fig. 6a

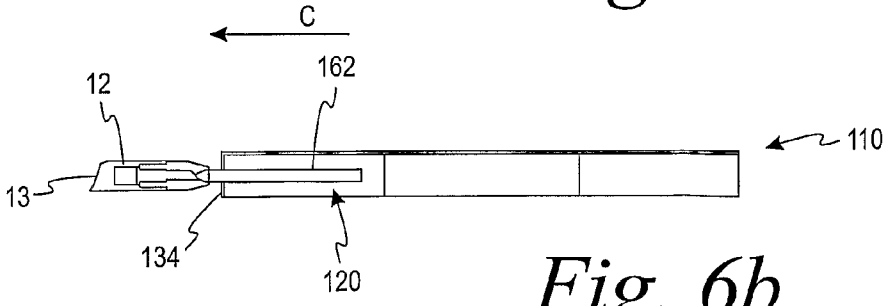



Fig. 6b

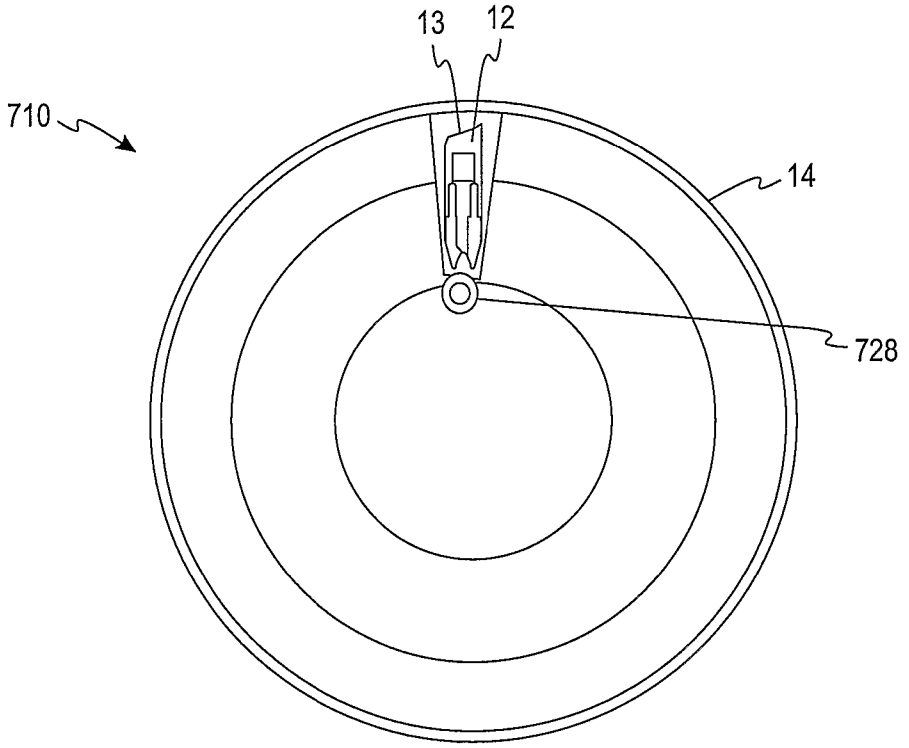



*Fig. 7*

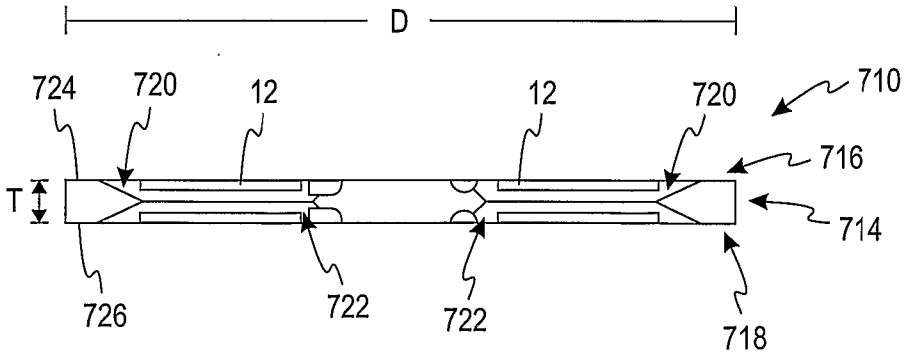



*Fig. 8*

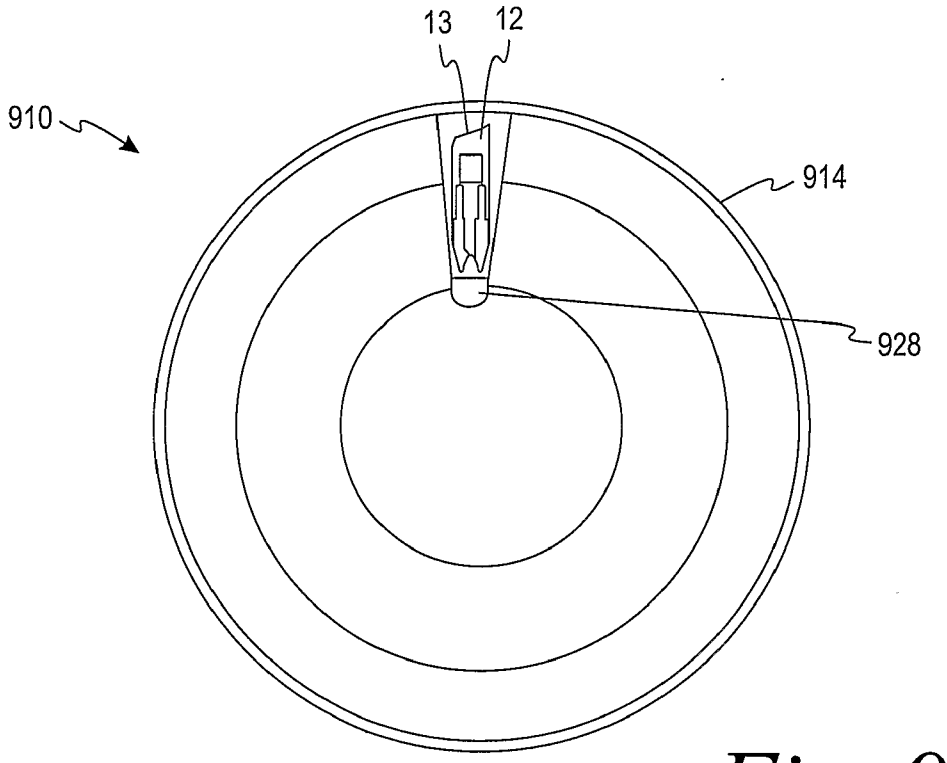



*Fig. 9*

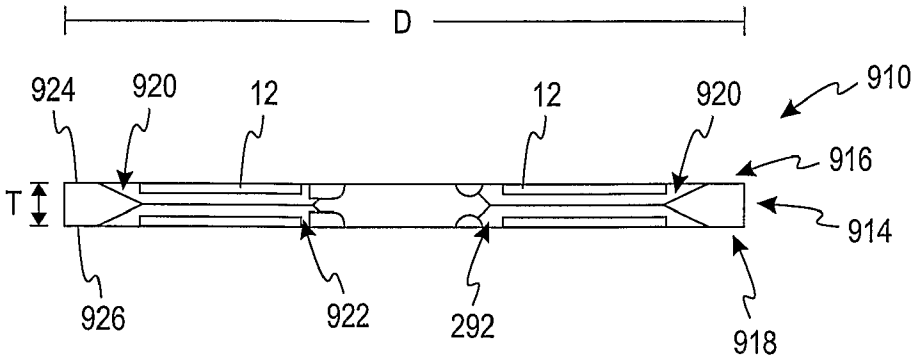



*Fig. 10*

# PACKAGING CONTAINER FOR TEST SENSORS

## FIELD OF THE INVENTION

[0001] The present invention relates generally to a packaging container for test sensors and, more particularly, to a circular packaging container for test sensors to be used in conjunction with a liquid sample monitoring device to provide an analyte concentration in a liquid sample.

## BACKGROUND OF THE INVENTION

[0002] Individuals who have irregular blood glucose concentration levels are often medically required to self-monitor their blood glucose concentration level. An irregular blood glucose level can be brought on by a variety of reasons, including illness, such as diabetes. The purpose of monitoring the blood glucose level is to determine the concentration level and then to take corrective action, based on whether the level is too high or too low, to bring the level back within a normal range. The failure to take corrective action may have serious adverse effects on the individual.

[0003] Beyond the above-described blood glucose concentration level monitoring, self-testing systems are used for determining the presence or concentration of other analytes in body fluids, such as, for example, cholesterol, alcohol, and hemoglobin in blood, interstitial fluid, or chemical substances in saliva.

[0004] One method of monitoring a person's blood glucose level is with a portable, hand-held, blood glucose testing device. The portable nature of these devices enables users to conveniently test their blood glucose levels wherever the users may be. The test device receives a test sensor for harvesting the blood for analysis. The test sensor, one of which is required for each test, contains a reaction area including a reagent for producing a measurable reaction with the glucose indicative of the blood glucose concentration level. The test sensor harvests the blood for reaction with the reagent stored within.

[0005] Prior art test devices exist that contain a plurality of test sensors or test strips in either a circular sensor packaging container or a cartridge sensor packaging container. An exemplary prior art circular sensor packaging container is disclosed in U.S. Pat. No. 5,575,403. In the prior art devices, a plane parallel to the width of the test sensor is parallel to a plane running through the top portion of the housing of the sensor packaging container

[0006] One drawback with prior art circular sensor packaging container is the limited number of test sensors contained in the container. The number of test sensors contained in the sensor packaging container is limited by the physical space available for the sensor packaging container within the handheld test device. Therefore, a need exists for a circular sensor packaging container that contains a greater number of test sensors without needing to dramatically increase the physical space taken up within the handheld test device by the circular sensor packaging container.

## SUMMARY OF THE INVENTION

[0007] According to one embodiment of the present invention, a test sensor packaging container for use in sensor instrument is provided. The test sensor packaging container comprises a housing, a first foil cover, and a second foil cover. The housing has a first housing layer and a second housing layer. The first housing layer has a first plurality of test sensor containing regions. Each of the first plurality of test sensor containing regions protrude radially outward from the center of the housing. The second housing layer has a second plurality of test sensor containing regions. Each of the second plurality of test sensor containing regions protrude radially outward from the center of the housing. The housing has a top portion and a bottom portion that are generally parallel. Each of the test sensors has a width direction and a thickness direction. The first foil cover is adapted to cover the top portion of the first housing layer of the housing. The second foil cover is adapted to cover the bottom portion of the second housing layer.

[0008] According to another embodiment of the present invention, a test sensor packaging container for use in sensor instrument is provided. The test sensor packaging container comprises a housing, a first foil cover, and a second foil cover. The housing has a first housing layer and a second housing layer. The first housing layer has a first plurality of test sensor containing regions and a first plurality of desiccant cavities in fluid communication with each of the first plurality of test sensor containing regions. The second housing layer has a second plurality of test sensor containing regions and a second plurality of desiccant cavities in fluid communication with each of the second plurality of test sensor containing regions. Each of the first and second plurality of test sensor containing regions has a proximal end and a distal end and is adapted to contain a test sensor. The first and second plurality of test sensor containing regions protrude radially outward from the center of the housing. The housing has a top portion and a bottom portion that are generally parallel. Each of the test sensors has a width direction and a thickness direction. The first foil cover is adapted to cover the top portion of the first housing layer of the housing. The second foil cover is adapted to cover the bottom portion of the second housing layer of the housing. The third foil cover is adapted to cover the distal end of the first plurality of test sensor containing regions. The fourth foil cover is adapted to cover the distal end of the second plurality of test sensor containing regions. A plane generally parallel to the width direction of each of the plurality of test sensors is generally perpendicular to the top and bottom portion of the housing.

[0009] According to a further embodiment of the present invention, a test sensor packaging container for use in sensor instrument is provided. The test sensor packaging container comprises a molded polymeric housing, a first foil cover, and a second foil cover. The housing has a first housing layer and a second housing layer. The first housing layer has a first plurality of test sensor containing regions and a first plurality of desiccant cavities in fluid communication with each of the first plurality of test sensor containing regions. The second housing layer has a second plurality of test sensor containing regions and a second plurality of desiccant cavities in fluid communication with each of the second plurality of test sensor containing regions. Each of the first and second plurality of test sensor containing regions has a proximal end and a distal end and is adapted to contain a test sensor. The first and second plurality of test sensor containing regions protrude radially outward from the center of the housing. The housing has a top portion and a bottom portion that are generally parallel. Each of the test sensors has a width direction and a thickness direction. The first foil cover is

adapted to cover the top portion of the first housing layer of the housing. The second foil cover is adapted to cover the bottom portion of the second housing layer of the housing. The third foil cover is adapted to cover the distal end of the first plurality of test sensor containing regions. The fourth foil cover is adapted to cover the distal end of the second plurality of test sensor containing regions. A plane generally parallel to the width direction of each of the plurality of test sensors is generally perpendicular to the top and bottom portion of the housing.

[0010] The above summary of the present invention is not intended to represent each embodiment or every aspect of the present invention. The detailed description and Figures will describe many of the embodiments of the present invention.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. **1** is a top view of a circular sensor packaging container according to one embodiment of the present invention.

[0012] FIG. **2** is a side view of the circular sensor packaging container of FIG. **1**.

[0013] FIG. **3** is a top view of a circular sensor packaging container according to another embodiment of the present invention.

[0014] FIG. **4** is a side view of the circular sensor packaging container of FIG. **3**.

[0015] FIGS. **5***a-c* show a partial cross-sectional view of a test sensor being dispensed from the circular sensor packaging container of FIG. **3** according to one embodiment of the present invention.

[0016] FIGS. **6***a-b* show a partial cross-sectional view of a test sensor being dispensed from the circular sensor packaging container of FIG. **3** according to another embodiment of the present invention.

[0017] FIG. **7** is a top view of a circular sensor packaging container according to a further embodiment of the present invention.

[0018] FIG. **8** is a side view of the circular sensor packaging container of FIG. **7**.

[0019] FIG. **9** is a top view of a circular sensor packaging container according to yet another embodiment of the present invention.

[0020] FIG. **10** is a side view of the circular sensor packaging container of FIG. **9**.

## DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

[0021] Referring now to the drawings, and initially to FIGS. **1** and **2**, a circular sensor packaging container **10** for holding a plurality of test sensors **12** used in determining a user's analyte concentration level in a fluid sample is shown according to one embodiment of the present invention. While the following discussion describes the use of test sensors for determining the glucose concentration in blood, it is understood that the present invention may be employed in determining the concentration of other analytes in other types of samples. Analytes that may be measured using the present invention include glucose, lipid profiles (e.g., cholesterol, triglycerides, LDL and HDL), microalbumin, hemoglobin $A_{1C}$, fructose, lactate, or biliribin. The present invention is not limited, however, to these specific analytes and it is contemplated that other analyte concentrations may be determined. The analytes may be in, for example, a whole blood sample, a blood serum sample, a blood plasma sample, or other body fluids like ISF (interstitial fluid) and urine.

[0022] The sensor packaging container **10** comprises a housing **14** having a first housing layer **16** and a second housing layer **18**. The first housing layer **16** having a plurality of first test sensor containing regions **20**. The second housing layer **18** having a plurality of second test sensor containing regions **22**. Each of the plurality of first and second test sensor containing regions **20**, **22** contain a single test sensor **12**. The housing **14** has a first foil cover **24** that is adapted to cover the first housing layer **16** of the packaging container **10**, sealing each of the plurality of test sensors **12** within the plurality of first test sensor containing regions **20** of the container **10**. Additionally, the housing **14** has a second foil cover **26** that is adapted to cover the second housing layer **18** of the packaging container **10**, sealing each of the plurality of test sensors **12** within the plurality of second test sensor containing regions **22** of the container **10**. The housing **14** and the first and second foil covers **24**, **26** completely seal the test sensor **12** from environment. The test sensor **12** has an angled face **13** for piercing the respective foil covers **24**, **26** covering the first or second test sensor containing region **20**, **22** of the container **10**.

[0023] A plurality of first desiccant cavities **28** is in fluid communication with each of the corresponding first sensor containing regions **20**. Additionally, a plurality of second desiccant cavities **30** are in fluid communication with each of the corresponding second sensor containing regions **22**. Desiccant material is disposed in the desiccant cavities **28**, **30** in order to ensure that the sensor containing regions **20**, **22** are maintained at an appropriate humidity level so that the reagent material in the test sensor **12** disposed in the particular sensor containing regions **20**, **22** is not adversely affected prior to being used. The desiccant material might be in the form of a small bag or a bead of material or any other form that can be readily disposed in the plurality of desiccant cavities **28**, **30**. The first desiccant cavities **28** are each in fluid communication with only a single first sensor containing region **20**. As a result, the opening of one of the first sensor containing regions **20** will not affect the desiccated state of any of the other first sensor containing regions **20**. Similarly, second desiccant cavities **30** are each in fluid communication with only a single second sensor containing region **22**. As a result, the opening of one of the second sensor containing regions **22** will not affect the desiccated state of any of the other second sensor containing regions **22**.

[0024] As is shown in FIG. **2**, the test sensor **12** is positioned within the plurality of sensor containing regions **16** of the packaging container **10** such that a plane generally parallel to the width of the test sensor **12** is also generally parallel to the plane of the first and second foil covers **24**, **26**. By having the first housing layer **16** and the second housing layer **18** the number of test sensors **12** held by the packaging container **10** increases. Increasing the number of test sensors **12** held by the packaging container **10** increases user satisfaction by increasing the number of sample tests that may be

performed between changing test sensor packaging containers. The test sensor packaging container **10** is adapted to contain from about fifteen (15) to about twenty five (25) test sensors **12**. More specifically, the test sensor packaging container **10** is adapted to contain about twenty (20) test sensors **12**. The test sensor packaging container **10** has a diameter D. The diameter D may range from about 40 mm to about 60 mm. More specifically, the diameter D may range from about 50 mm to about 55 mm. The test sensor packaging container **10** has a thickness T. The thickness T of the packaging container **10** may range from about 2 mm to about 8 mm. More specifically, the thickness T of the test sensor packaging container is about 4 mm.

[**0025**] Turning now to FIGS. **3** and **4**, a circular sensor packaging container **110** for holding a plurality of test sensors **12** used in determining a user's analyte concentration level in a fluid sample is shown according to another embodiment of the present invention. The sensor packaging container **110** comprises a housing **114** having a first housing layer **116** and a second housing layer **118**. The first housing layer **114** has a plurality of first test sensor containing regions **120**. The second housing layer **118** has a plurality of second test sensor containing regions **122**. Each of the plurality of first and second test sensor containing regions **120**, **122** contains a single test sensor **12**.

[**0026**] The plurality of test sensor containing regions **120**, **122** protrudes out from the center of the housing **114**. An open region **132** is formed between each of the plurality of sensor containing regions **120**, **122**. The sensor containing regions **120**, **122** and the open regions **132** forms a generally gear shaped pattern on the sensor packaging container **110**.

[**0027**] The first housing layer **116** has a first foil cover **124** that is adapted to cover the top portion of the first housing layer **116** of the packaging container **110**, sealing the test sensor **12** within the container **110**. Additionally, the first housing layer **116** has a third foil cover **134** that is adapted to cover a distal end of the plurality of first sensor containing regions **120** of the first housing layer **116**, further sealing the test sensor **12** within the packaging container **110**. The first housing layer **116** and the first and third foil covers **124**, **134** completely seal the test sensor **12** of the first housing layer **116** from environment.

[**0028**] Similarly, the second housing layer **118** has a second foil cover **126** that is adapted to cover the bottom portion of the second housing layer **118** of the packaging container **110**, sealing the test sensor **12** within the container **110**. Additionally, the second housing layer **118** has a fourth foil cover **136** that is adapted to cover a distal end of the plurality of second sensor containing regions **122** of the second housing layer **118**, further sealing the test sensor **12** within the packaging container **110**. The second housing layer **118** and the second and fourth foil covers **126**, **136** completely seal the test sensor **12** of the second housing layer **118** from environment.

[**0029**] The test sensor **12** has an angled face **13** for piercing the respective foil covers **134**, **136** covering the distal end of the first or second test sensor containing region **120**, **122** of the container **110**.

[**0030**] A plurality of first desiccant cavities **128** is in fluid communication with each of the corresponding first sensor containing regions **120**. Additionally, a plurality of second desiccant cavities **130** is in fluid communication with each of the corresponding second sensor containing regions **122**. Desiccant material is disposed in the desiccant cavities **128**, **130** in order to ensure that the sensor containing regions **120**, **122** are maintained at an appropriate humidity level so that the reagent material in the test sensor **12** disposed in the particular sensor containing regions **120**, **122** is not adversely affected prior to being used. The desiccant material might be in the form of a small bag or a bead of material or any other form that can be readily disposed in the plurality of desiccant cavities **128**, **130**. The first desiccant cavities **128** are each in fluid communication with only a single first sensor containing region **120**. As a result, the opening of one of the first sensor containing regions **120** will not affect the desiccated state of any of the other first sensor containing regions **120**. Similarly, second desiccant cavities **130** are each in fluid communication with only a single second sensor containing region **122**. As a result, the opening of one of the second sensor containing regions **122** will not affect the desiccated state of any of the other second sensor containing regions **122**.

[**0031**] Referring to FIG. **3**, the housing **114** of the test sensor packaging container **110** comprises a molded polymeric material according to one embodiment of the present invention. Using a molded polymeric material for the housing **114** increases the structural rigidity of the test sensor packaging container **110**. The increased structural rigidity of the housing **114** provided by using a molded polymeric material to form the housing **114** allows the open regions **132** located between each of the plurality of sensor containing regions **120**, **122** to be used to align the test sensor packaging container **110** within a testing device.

[**0032**] As is shown in FIG. **4**, the test sensor **12** is positioned within the plurality of sensor containing regions **120**, **122** of the packaging container **110** such that a plane generally parallel to the width of the test sensor **12** is generally perpendicular to the plane of the top portion of the housing **114** of the test sensor packaging container **110**. Arranging the test sensor **12** in such a configuration reduces the amount of space along the periphery of the housing **114** required for each test sensor **12** as the test sensors **12** have a width that is greater than their thickness. Therefore, additional test sensors **12** may be placed within the packaging container **110**. In this way the diameter of the test sensor packaging container **110** does not dramatically increase in order to increase the number of test sensors **12** held by the test sensor packaging container **110**. Increasing the number of test sensors **12** held by the packaging container **110** increases user satisfaction by increasing the number of sample tests that may be performed between changing test sensor packaging containers. The test sensor packaging container **110** is adapted to contain from about fifty (50) to about seventy (70) test sensors **12**. More specifically, the test sensor packaging container is adapted to contain about sixty (60) test sensors **12**. The test sensor packaging container **110** has a diameter D'. The diameter D' may range from about 40 mm to about 55 mm. More specifically, the diameter D' may range from about 45 mm to about 50 mm. The test sensor packaging container **110** has a thickness T'. The thickness T' of the packaging container **110** may range from about 2 mm to about 6 mm. More specifically, the thickness T' of the test sensor packaging container is about 4 mm.

[0033] Turning now to FIGS. **5***a-c*, the dispensing of one of the test sensors **12** of the first housing layer **116** of test sensor packaging container **110** is shown. As seen in FIG. **5***a* the test sensor packaging container **110** is shown in conjunction with a knife assembly **160**. As shown in FIG. **5***a* the knife assembly **160** has generally a "T" shape, however, other shapes may be used for knife assembly **160**. The knife assembly **160** is positioned above the first foil cover **124** of one of the plurality of first test sensor containing regions **120**. The knife assembly **160** is adapted move in the direction of arrow A to puncture the first foil cover **124** of the packaging container **110**. As shown in FIG. **5***b*, the knife assembly **160** is positioned after it punctures the first foil cover **124** and position the knife assembly **160** within one of the first test sensor containing regions **120**. FIG. **5***c* shows the test sensor **12** after it has been dispensed from the first test sensor containing region **120** of the packaging container **110**. The knife assembly **160** moves in the direction shown by arrow B in a radial direction towards the distal end of the first test sensor containing region **120** of the packaging container **110**. As the knife assembly **160** moves in the direction of arrow B it contact the test sensor **12**, forcing the test sensor **12** towards the distal end of the first test sensor containing region **120**. The test sensor **12** contains an angled face **13** that contacts the third foil cover **134** of the packaging container **110**. The angled face **13** of the test sensor **12** is adapted to puncture the third foil cover **134** of the packaging container **110**. As the knife assembly **160** moves, it continues to puncture the first foil cover **124** covering the first test sensor containing region **120** corresponding to the test sensor **12** being dispensed.

[0034] Turning now to FIGS. **6***a* and **6***b*, the dispensing of one of the test sensors **12** of the first housing layer **116** of the test sensor packaging container **110** is shown. As seen in FIG. **6***a* the test sensor packaging container **110** is shown in conjunction with a knife assembly **162**. As shown in FIG. **6***a* the knife assembly **162** is positioned at a proximal end of one of the plurality of first test sensor containing regions **120**. The knife assembly **162** is adapted to slide outward in a radial direction, as shown by arrow C, from the proximal end of one of the plurality of first test sensor containing regions **120** towards the distal end of one of the first test sensor containing regions **120**. As shown in FIG. **6***b*, the test sensor **12** is shown after it has been dispensed from one of the first test sensor containing regions **120** of the packaging container **110**. The knife assembly **162** moves in the direction of arrow C towards the distal end of one of the first test sensor containing regions **120** of the packaging container **110**. As the knife assembly **162** moves, it contact the test sensor **12** forcing the test sensor **12** towards the distal end of the test sensor containing region. The test sensor **12** contains an angled face **13** that contacts the third foil cover **134** of the packaging container **110**. The angled face **13** of the test sensor **12** is adapted to puncture the third foil cover **134** of the packaging container **10**.

[0035] Turning now to FIGS. **7** and **8**, a circular sensor packaging container **710** for holding a plurality of test sensors **12** used in determining a user's analyte concentration level in a fluid sample is shown according to another embodiment of the present invention.

[0036] The sensor packaging container **710** comprises a housing **714** having a first housing layer **716** and a second housing layer **718**. The first housing layer **716** having a plurality of first test sensor containing regions **720**. The second housing layer **718** having a plurality of second test sensor containing regions **722**. Each of the plurality of first and second test sensor containing regions **720**, **722** contain a single test sensor **12**. The housing **714** has a first foil cover **724** that is adapted to cover the first housing layer **716** of the packaging container **710**, sealing each of the plurality of test sensors **12** within the plurality of first test sensor containing regions **720** of the container **710**. Additionally, the housing **714** has a second foil cover **726** that is adapted to cover the second housing layer **718** of the packaging container **710**, sealing each of the plurality of test sensors **12** within the plurality of second test sensor containing regions **722** of the container **710**. The housing **714** and the first and second foil covers **724**, **726** completely seal the test sensor **12** from environment. The test sensor **12** has an angled face **13** for piercing the respective foil covers **724**, **726** covering the first or second test sensor containing region **720**, **722** of the container **710**.

[0037] A plurality of first desiccant cavities **728** is in fluid communication with each of the corresponding first sensor containing regions **720**. Additionally, a plurality of second desiccant cavities **730** are in fluid communication with each of the corresponding second sensor containing regions **722**. The desiccant cavities **728**, **730** are located at the proximal end of the sensor containing regions **720**, **722**. Desiccant material is disposed in the desiccant cavities **728**, **730** in order to ensure that the sensor containing regions **720**, **722** are maintained at an appropriate humidity level so that the reagent material in the test sensor **12** disposed in the particular sensor containing regions **720**, **722** is not adversely affected prior to being used. The desiccant material might be in the form of a small bag or a bead of material or any other form that can be readily disposed in the plurality of desiccant cavities **728**, **730**. The first desiccant cavities **728** are each in fluid communication with only a single first sensor containing region **720**. As a result, the opening of one of the first sensor containing regions **720** will not affect the desiccated state of any of the other first sensor containing regions **720**. Similarly, second desiccant cavities **730** are each in fluid communication with only a single second sensor containing region **722**. As a result, the opening of one of the second sensor containing regions **722** will not affect the desiccated state of any of the other second sensor containing regions **722**.

[0038] As is shown in FIG. **8**, the test sensor **12** is positioned within the plurality of sensor containing regions **716** of the packaging container **710** such that a plane generally parallel to the width of the test sensor **712** is also generally parallel to the plane of the first and second foil covers **724**, **726**. By having the first housing layer **716** and the second housing layer **718** the number of test sensors **12** held by the packaging container **710** increases. Increasing the number of test sensors **12** held by the packaging container **710** increases user satisfaction by increasing the number of sample tests that may be performed between changing test sensor packaging containers. The test sensor packaging container **710** is adapted to contain from about fifteen (15) to about twenty five (25) test sensors **12**. More specifically, the test sensor packaging container **710** is adapted to contain about twenty (20) test sensors **12**. The test sensor packaging container **710** has a diameter D. The diameter D may range from about 40 mm to about 60 mm. More specifically, the diameter D may range from about 50

mm to about 55 mm. The test sensor packaging container **710** has a thickness T. The thickness T of the packaging container **710** may range from about 2 mm to about 8 mm. More specifically, the thickness T of the test sensor packaging container **710** is about 4 mm.

[**0039**] Turning now to FIGS. **9** and **10**, a circular sensor packaging container **910** for holding a plurality of test sensors **12** used in determining a user's analyte concentration level in a fluid sample is shown according to a further embodiment of the present invention. The sensor packaging container **910** comprises a housing **914** having a first housing layer **916** and a second housing layer **918**. The first housing layer **916** has a plurality of first test sensor containing regions **920**. The second housing layer **918** has a plurality of second test sensor containing regions **922**. Each of the plurality of first and second test sensor containing regions **920**, **922** contains a single test sensor **912**. The housing **914** has a first foil cover **924** that is adapted to cover the first housing layer **916** of the packaging container **910**, sealing each of the plurality of test sensors **12** within the plurality of first test sensor containing regions **920** of the container **910**. Additionally, the housing **914** has a second foil cover **926** that is adapted to cover the second housing layer **918** of the packaging container **910**, sealing each of the plurality of test sensors **12** within the plurality of second test sensor containing regions **922** of the container **910**. The housing **914** and the first and second foil covers **924**, **926** completely seal the test sensor **12** from environment. The test sensor **12** has an angled face **13** for piercing the respective foil covers **924**, **926** covering the first or second test sensor containing region **920**, **922** of the container **910**.

[**0040**] A plurality of first desiccant regions **928** is in fluid communication with each of the corresponding first sensor containing regions **920**. Additionally, a plurality of second desiccant regions **930** is in fluid communication with each of the corresponding second sensor containing regions **922**. Desiccant material is disposed in the desiccant regions **928**, **930** in order to ensure that the sensor containing regions **920**, **922** are maintained at an appropriate humidity level so that the reagent material in the test sensor **12** disposed in the particular sensor containing regions **920**, **922** is not adversely affected prior to being used. The desiccant material of the desiccant regions **928**,**930** is in the form of a hot-melt desiccant. The hot-melt desiccant is molded into the housing **914** of the test sensor packaging container **910**. Using a hot-mold desiccant material simplifies the manufacturing of the packaging container **910** by avoiding the need to fill a desiccant cavity with a desiccant material. The hot-melt desiccant also may be formed in a wide variety of shapes, giving greater flexibility in the positioning of the desiccant. The first desiccant regions **928** are each in fluid communication with only a single first sensor containing region **920**. As a result, the opening of one of the first sensor containing regions **920** will not affect the desiccated state of any of the other first sensor containing regions **920**. Similarly, second desiccant regions **930** are each in fluid communication with only a single second sensor containing region **922**. As a result, the opening of one of the second sensor containing regions **922** will not affect the desiccated state of any of the other second sensor containing regions **922**.

[**0041**] As is shown in FIG. **10**, the test sensor **12** is positioned within the plurality of sensor containing regions **916** of the packaging container **910** such that a plane generally parallel to the width of the test sensor **12** is also generally parallel to the plane of the first and second foil covers **924**, **926**. By having the first housing layer **916** and the second housing layer **918** the number of test sensors **12** held by the packaging container **910** increases. Increasing the number of test sensors **12** held by the packaging container **910** increases user satisfaction by increasing the number of sample tests that may be performed between changing test sensor packaging containers. The test sensor packaging container **910** is adapted to contain from about fifteen (15) to about twenty five (25) test sensors **12**. More specifically, the test sensor packaging container **910** is adapted to contain about twenty (20) test sensors **12**. The test sensor packaging container **910** has a diameter D. The diameter D may range from about 40 mm to about 60 mm. More specifically, the diameter D may range from about 50 mm to about 55 mm. The test sensor packaging container **910** has a thickness T. The thickness T of the packaging container **910** may range from about 2 mm to about 8 mm. More specifically, the thickness T of the test sensor packaging container **910** is about 4 mm.

Alternative Embodiment A

[**0042**] A test sensor packaging container for use in a sensor instrument for handling a plurality of test sensors, the test sensor packaging container comprising:

[**0043**] a housing having first housing layer and a second housing layer, the first housing layer having a first plurality of test sensor containing regions, each of the first plurality of test sensor containing regions being adapted to contain one of the plurality of test sensors, each of the first plurality of test sensor containing regions protruding radially outward from the center of the housing, the second housing layer having a second plurality of sensor containing regions, each of the second plurality of test sensor containing regions protruding radially outward from the center of the housing, the housing having a top portion and a bottom portion that are generally parallel, each of the plurality of test sensors having a width direction and a thickness direction;

[**0044**] a first foil cover adapted to cover the top portion of the first housing layer of the housing; and

[**0045**] a second foil cover adapted to cover the bottom portion of the second housing layer of the housing.

Alternative Embodiment B

[**0046**] The test sensor packaging container of Alternative Embodiment A further comprising a plurality of first desiccant cavities in fluid communication with each of the first test sensor containing regions; and

[**0047**] a plurality of second desiccant cavities in fluid communication with each of the second sensor containing regions.

Alternative Embodiment C

[**0048**] The test sensor packaging container of Alternative Embodiment B further having desiccant material in each of the plurality of first and second desiccant cavities such that each of the test sensor containing regions is maintained in a desiccate state.

Alternative Embodiment D

[0049] The test sensor packaging container of Alternative Embodiment A wherein the housing has from about fifteen (15) to about twenty five (25) test sensor containing regions.

Alternative Embodiment E

[0050] The test sensor packaging container of Alternative Embodiment D wherein the housing has about twenty (20) test sensor containing regions.

Alternative Embodiment F

[0051] The test sensor packaging container of Alternative Embodiment A wherein the housing has a diameter from about 40 mm to about 60 mm.

Alternative Embodiment G

[0052] The test sensor packaging container of Alternative Embodiment F wherein the housing has a diameter of from about 50 mm to about 55 mm.

Alternative Embodiment H

[0053] The test sensor packaging container of Alternative Embodiment A wherein the housing has a thickness of from about 2 mm to about 8 mm.

Alternative Embodiment I

[0054] The test sensor packaging container of Alternative Embodiment H wherein the housing has a thickness of about 4 mm.

Alternative Embodiment J

[0055] The test sensor packaging container of Alternative Embodiment A wherein the housing of the test sensor packaging container is made of a molded polymeric material.

Alternative Embodiment K

[0056] A test sensor packaging container for use in a sensor instrument for handling a plurality of test sensors, the test sensor packaging container comprising:

[0057] a housing having a first housing layer and a second housing layer, the first housing layer having a first plurality of test sensor containing regions and a first plurality of desiccant cavities in fluid communication with each of the first plurality of test sensor containing regions, the second housing layer having a second plurality of test sensor containing regions and a second plurality of desiccant cavities in fluid communication with each of the second plurality of test sensor containing regions, each of the first and second plurality of test sensor containing regions having a proximal end and a distal end and being adapted to contain one of the plurality of test sensors, each of the first and second plurality of test sensor containing regions protruding radially outward from the center of the housing, the housing having a top portion and a bottom portion that are generally parallel, each of the plurality of test sensors having a width direction and a thickness direction;

[0058] a first foil cover adapted to cover the top portion of the first housing layer of the housing;

[0059] a second foil cover adapted to cover the bottom portion of the second housing layer of the housing;

[0060] a third foil cover adapted to cover the distal end of the first plurality of test sensor containing regions; and

[0061] a fourth foil cover adapted to cover the distal end of the second plurality of test sensor containing regions,

[0062] wherein a plane generally parallel to the width direction of each of the plurality of test sensors is generally perpendicular to the top and bottom portion of the housing.

Alternative Embodiment L

[0063] The test sensor packaging container of Alternative Embodiment K further comprising a plurality of open regions formed between each of the first and second plurality of sensor containing regions.

Alternative Embodiment M

[0064] The test sensor packaging container of Alternative Embodiment L wherein the first and second plurality of test sensor containing regions and the plurality of open regions form a generally gear shaped container, the open regions being positioned on the housing to properly position the test sensor packaging container when the test sensor packaging container is in the sensor instrument.

Alternative Embodiment N

[0065] The test sensor packaging container of Alternative Embodiment K wherein the container has from about fifty (50) to about seventy (70) test sensor containing regions.

Alternative Embodiment O

[0066] The test sensor packaging container of Alternative Embodiment N wherein the container has about sixty (60) test sensor containing regions.

Alternative Embodiment P

[0067] The test sensor packaging container of Alternative Embodiment K wherein the housing has a diameter from about 40 mm to about 55 mm.

Alternative Embodiment Q

[0068] The test sensor packaging container of Alternative Embodiment P wherein the housing has a diameter of from about 45 mm to about 50 mm.

Alternative Embodiment R

[0069] The test sensor packaging container of Alternative Embodiment K wherein the housing has a thickness of from about 2 mm to about 6 mm.

Alternative Embodiment S

[0070] The test sensor packaging container of Alternative Embodiment R wherein the housing has a thickness of about 4 mm.

Alternative Embodiment T

[0071] The test sensor packaging container of Alternative Embodiment K wherein the housing of the test sensor packaging container is made of a molded polymeric material.

Alternative Embodiment U

[0072] A test sensor packaging container for use in a sensor instrument for handling a plurality of test sensors, the test sensor packaging container comprising:

[0073] a molded polymeric housing having a first housing layer and a second housing layer, the first housing layer having a first plurality of test sensor containing regions and a first plurality of desiccant cavities in fluid communication with each of the first plurality of test sensor containing regions, the second housing layer having a second plurality of test sensor containing regions and a second plurality of desiccant cavities in fluid communication with each of the second plurality of test sensor containing regions, each of the first and second plurality of test sensor containing regions having a proximal end and a distal end and being adapted to contain one of the plurality of test sensors, each of the first and second plurality of test sensor containing regions protruding radially outward from the center of the housing, the housing having a top portion and a bottom portion that are generally parallel, each of the plurality of test sensors having a width direction and a thickness direction;

[0074] a first foil cover adapted to cover the top portion of the first housing layer of the housing;

[0075] a second foil cover adapted to cover the bottom portion of the second housing layer of the housing;

[0076] a third foil cover adapted to cover the distal end of the first plurality of test sensor containing regions; and

[0077] a fourth foil cover adapted to cover the distal end of the second plurality of test sensor containing regions,

[0078] wherein a plane generally parallel to the width direction of each of the plurality of test sensors is generally perpendicular to the top and bottom portion of the housing.

Alternative Embodiment V

[0079] The test sensor packaging container of Alternative Embodiment U wherein the housing has from about fifty (50) to about seventy (70) test sensor containing regions.

Alternative Embodiment W

[0080] The test sensor packaging container of Alternative Embodiment U wherein the housing has about sixty (60) test sensor containing regions.

Alternative Embodiment X

[0081] The test sensor packaging container of Alternative Embodiment U wherein the housing has a diameter from about 40 mm to about 55 mm.

Alternative Embodiment Y

[0082] The test sensor packaging container of Alternative Embodiment X wherein the housing has a diameter of from about 45 mm to about 50 mm.

Alternative Embodiment Z

[0083] The test sensor packaging container of Alternative Embodiment U wherein the housing has a thickness of from about 2 mm to about 6 mm.

Alternative Embodiment AA

[0084] The test sensor packaging container of Alternative Embodiment Z wherein the housing has a thickness of about 4 mm.

[0085] While the invention is susceptible to various modifications and alternative forms, specific embodiments have been shown by way of example in the drawings and will be described in detail herein. It should be understood, however, that the invention is not intended to be limited to the particular forms disclosed. Rather, the invention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined in the appended claims.

1. A test sensor packaging container for use in a sensor instrument for handling a plurality of test sensors, the test sensor packaging container comprising:

a housing having first housing layer and a second housing layer, the first housing layer having a first plurality of test sensor containing regions, each of the first plurality of test sensor containing regions being adapted to contain one of the plurality of test sensors, each of the first plurality of test sensor containing regions protruding radially outward from the center of the housing, the second housing layer having a second plurality of sensor containing regions, each of the second plurality of test sensor containing regions protruding radially outward from the center of the housing, the housing having a top portion and a bottom portion that are generally parallel, each of the plurality of test sensors having a width direction and a thickness direction;

a first foil cover adapted to cover the top portion of the first housing layer of the housing; and

a second foil cover adapted to cover the bottom portion of the second housing layer of the housing.

2. The test sensor packaging container of claim 1, further comprising a plurality of first desiccant cavities in fluid communication with each of the first test sensor containing regions; and

a plurality of second desiccant cavities in fluid communication with each of the second sensor containing regions.

3. The test sensor packaging container of claim 2, further having desiccant material in each of the plurality of first and second desiccant cavities such that each of the test sensor containing regions is maintained in a desiccate state.

4. The test sensor packaging container of claim 1, wherein the housing has from about fifteen (15) to about twenty five (25) test sensor containing regions.

5. (canceled)

6. The test sensor packaging container of claim 1, wherein the housing has a diameter from about 40 mm to about 60 mm.

7. The test sensor packaging container of claim 6, wherein the housing has a diameter of from about 50 mm to about 55 mm.

8. The test sensor packaging container of claim 1, wherein the housing has a thickness of from about 2 mm to about 8 mm.

9. The test sensor packaging container of claim 8, wherein the housing has a thickness of about 4 mm.

**10**. The test sensor packaging container of claim 1, wherein the housing of the test sensor packaging container is made of a molded polymeric material.

**11**. A test sensor packaging container for use in a sensor instrument for handling a plurality of test sensors, the test sensor packaging container comprising:

a housing having a first housing layer and a second housing layer, the first housing layer having a first plurality of test sensor containing regions and a first plurality of desiccant cavities in fluid communication with each of the first plurality of test sensor containing regions, the second housing layer having a second plurality of test sensor containing regions and a second plurality of desiccant cavities in fluid communication with each of the second plurality of test sensor containing regions, each of the first and second plurality of test sensor containing regions having a proximal end and a distal end and being adapted to contain one of the plurality of test sensors, each of the first and second plurality of test sensor containing regions protruding radially outward from the center of the housing, the housing having a top portion and a bottom portion that are generally parallel, each of the plurality of test sensors having a width direction and a thickness direction;

a first foil cover adapted to cover the top portion of the first housing layer of the housing;

a second foil cover adapted to cover the bottom portion of the second housing layer of the housing;

a third foil cover adapted to cover the distal end of the first plurality of test sensor containing regions; and

a fourth foil cover adapted to cover the distal end of the second plurality of test sensor containing regions,

wherein a plane generally parallel to the width direction of each of the plurality of test sensors is generally perpendicular to the top and bottom portion of the housing.

**12**. The test sensor packaging container of claim 11, further comprising a plurality of open regions formed between each of the first and second plurality of sensor containing regions.

**13**. The test sensor packaging container of claim 12, wherein the first and second plurality of test sensor containing regions and the plurality of open regions form a generally gear shaped container, the open regions being positioned on the housing to properly position the test sensor packaging container when the test sensor packaging container is in the sensor instrument.

**14**. The test sensor packaging container of claim 11, wherein the container has from about fifty (50) to about seventy (70) test sensor containing regions.

**15**. (canceled)

**16**. The test sensor packaging container of claim 11, wherein the housing has a diameter from about 40 mm to about 55 mm.

**17**. (canceled)

**18**. The test sensor packaging container of claim 11, wherein the housing has a thickness of from about 2 mm to about 6 mm.

**19**. (canceled)

**20**. The test sensor packaging container of claim 11, wherein the housing of the test sensor packaging container is made of a molded polymeric material.

**21**. A test sensor packaging container for use in a sensor instrument for handling a plurality of test sensors, the test sensor packaging container comprising:

a molded polymeric housing having a first housing layer and a second housing layer, the first housing layer having a first plurality of test sensor containing regions and a first plurality of desiccant cavities in fluid communication with each of the first plurality of test sensor containing regions, the second housing layer having a second plurality of test sensor containing regions and a second plurality of desiccant cavities in fluid communication with each of the second plurality of test sensor containing regions, each of the first and second plurality of test sensor containing regions having a proximal end and a distal end and being adapted to contain one of the plurality of test sensors, each of the first and second plurality of test sensor containing regions protruding radially outward from the center of the housing, the housing having a top portion and a bottom portion that are generally parallel, each of the plurality of test sensors having a width direction and a thickness direction;

a first foil cover adapted to cover the top portion of the first housing layer of the housing;

a second foil cover adapted to cover the bottom portion of the second housing layer of the housing;

a third foil cover adapted to cover the distal end of the first plurality of test sensor containing regions; and

a fourth foil cover adapted to cover the distal end of the second plurality of test sensor containing regions,

wherein a plane generally parallel to the width direction of each of the plurality of test sensors is generally perpendicular to the top and bottom portion of the housing.

**22**. The test sensor packaging container of claim 21, wherein the housing has from about fifty (50) to about seventy (70) test sensor containing regions.

**23**. (canceled)

**24**. The test sensor packaging container of claim 21, wherein the housing has a diameter from about 40 mm to about 55 mm.

**25**. (canceled)

**26**. The test sensor packaging container of claim 21, wherein the housing has a thickness of from about 2 mm to about 6 mm.

**27**. (canceled)

* * * * *