CLAIMS

1. A system for detecting fluid on a substrate comprising:

a sensor board;

a first capacitive sensor mounted on the sensor board, the first capacitive sensor having a transmit sensor pad for transmitting a signal, a receive sensor pad for receiving the signal, and an analog-to-digital convertor connected with the receive sensor pad, wherein a pad gap is formed between the transmit sensor pad and the receive sensor pad, thereby forming an interdigitated finger pattern, and wherein the pad gap is less than 1 millimeter; and

a platform upon which the substrate is to be placed, wherein the platform is a first distance from the transmit and receive sensor pads.

2. The system of claim 1, wherein the platform includes a mounting surface which is generally level with the ground.

3. The system of claim 1, wherein the platform includes a mounting surface upon which the substrate is to be placed, wherein the platform is connected with a rotational device for rotating the platform about a centralized axis normal with the mounting surface.

4. The system of claim 1, wherein the first distance is less than 10 mm.

5. The system of claim 1 further comprising a second capacitive sensor mounted on the sensor board adjacent the first capacitive sensor to form an array of capacitive sensors.

6. The system of claim 1, wherein the platform moves in a first direction with respect to the sensor board, wherein the pad gap is formed between the transmit sensor pad and the receive sensor pad along a second direction, and wherein the second direction of the pad gap is not parallel to or tangent to the first direction.

7. The system of claim 1, wherein the platform is a conveyor system.

8. A method for detection of fluid on a substrate comprising:

placing the substrate on a platform under a fluid detector, wherein the fluid detector comprises a sensor board and a first capacitive sensor mounted on the sensor board, wherein the capacitive sensor includes a transmit sensor pad for transmitting a signal, and a receive sensor pad for receiving the signal, and wherein a pad gap is formed between the transmit sensor pad and the receive sensor pad, thereby forming an interdigitated finger pattern and wherein the pad gap is less than 1 millimeter;

measuring a capacitance value between the transmit sensor pad and the receive sensor pad of the capacitive sensor; and

determining if fluid is on the substrate based on the measured capacitance value.

9. The method of claim 8 further comprising moving the substrate under the fluid detector and measuring any change in the capacitance value while the substrate is being moved.

10. The method of claim 8 further comprising issuing an alert if it is determined that fluid is on the substrate.

11. The method of claim 8, wherein the first capacitive sensor further comprises an analog-to-digital convertor connected with the receive sensor pad.

12. The method of claim 8 further comprising moving the substrate in a rotational direction under the fluid detector.

13. An apparatus for detecting fluid on a substrate comprising:

a first capacitive sensor positioned a distance away from a platform upon which the substrate is to be placed, the first capacitive sensor having a transmit sensor pad for transmitting a capacitance signal, a receive sensor pad for receiving the capacitance signal, and an analog-to-digital convertor connected with the receive sensor pad, wherein a pad gap is formed between the transmit sensor pad and the receive sensor

pad, thereby forming an interdigitated finger pattern, wherein the pad gap is less than 1 millimeter, and wherein the capacitive sensor is capable of forming an electric field between the transmit sensor pad and the receive sensor pad when transmitting the capacitance signal, and wherein the electric field is capable of traveling to a surface of the substrate on the platform; and

detection circuitry connected with the analog-to-digital convertor, comprising a microprocessor executing pattern recognition and decision making algorithms, wherein the detection circuitry is for analyzing any change in the capacitance signal by determining any change in the electric field and then determining if any fluid is present on the surface of the substrate on the platform.

14. The apparatus of claim 13, wherein both the transmit sensor pad and the receive sensor pad are mounted above the platform.

15. The apparatus of claim 13, wherein the first capacitive sensor is able to measure a change in the capacitance signal of 100 pico-Farads or less, with a resolution of five femto-Farads or less.

16. The apparatus of claim 13, wherein the first capacitive sensor is able to measure a change in the capacitance signal of 100 pico-Farads or less, with a resolution of five femto-Farads or less.

17. The apparatus of claim 13, wherein the first capacitive sensor generates a fringing field between the transmit sensor pad and the receive sensor pad when transmitting the capacitance signal.

18. The apparatus of claim 17, wherein the fringing field extends out at least 2 millimeters from either the transmit sensor pad or the receive sensor pad.

19. The apparatus of claim 13, further comprising a second capacitive sensor mounted on the sensor board adjacent to the first capacitive sensor to form an array of capacitive sensors.

20. The apparatus of claim 13, wherein an array of capacitive sensors is mounted on the sensor board, wherein a length of the array is 100 mm or more.

CLAIMS

1. A system for detecting fluid on a substrate comprising:

a sensor board;

a first capacitive sensor mounted on the sensor board, the first capacitive sensor having a transmit sensor pad for transmitting a signal, a receive sensor pad for receiving the signal, and an analog-to-digital convertor connected with the receive sensor pad for analyzing the received signal; and

a platform upon which the substrate is to be placed, wherein the platform is a first distance from the transmit and receive sensor pads.

2. The system of claim 1, wherein the platform includes a mounting surface which is generally level with the ground.

3. The system of claim 1, wherein the platform includes a mounting surface upon which the substrate is to be placed, wherein the platform is connected with a rotational device for rotating the platform about a centralized axis normal with the mounting surface.

4. The system of claim 1, wherein the first distance is less than 10 mm.

5. The system of claim 1 further comprising a second capacitive sensor mounted on the sensor board adjacent the first capacitive sensor to form an array of capacitive sensors.

6. The system of claim 1, wherein the platform moves in a first direction with respect to the sensor board, wherein a pad gap is formed between the transmit pad and the receive pad along a second direction, and wherein the second direction of the pad gap is not parallel to or tangent to the first direction.

7. The system of claim 1, wherein the platform is a conveyor system.

8. A method for detection of fluid on a substrate comprising:

placing a substrate on a platform under a fluid detector, wherein the fluid detector comprises a sensor board and a first capacitive sensor mounted on the sensor board; and

measuring the capacitance of the capacitive sensor; and

determining if fluid is on the substrate based on the measured capacitance of the capacitive sensor.

9. The method of claim 8 further comprising moving the substrate under the fluid detector and measuring any change in capacitance of the first capacitive sensor while the substrate is being moved.

10. The method of claim 8 further comprising issuing an alert if it is determined that fluid is on the substrate.

11. The method of claim 8, wherein the first capacitive sensor has a transmit sensor pad for transmitting a signal, a receive sensor pad for receiving the signal, and an analog-to-digital convertor connected with the receive sensor pad for analyzing the received signal.

12. The method of claim 8 further comprising moving the substrate in a rotational direction under the fluid detector.

13. An apparatus for detecting fluid on a substrate comprising:

a first capacitive sensor positioned a distance away from a platform upon which the substrate is to be placed, the first capacitive sensor having a transmit sensor pad for transmitting a capacitance signal, a receive sensor pad for receiving the capacitance signal, and an analog-to-digital convertor connected with the receive sensor pad for analyzing the received capacitance signal and determining any change in capacitance of the first capacitive sensor, wherein the capacitive sensor is capable of forming an electric field between the transmit sensor pad and the receive sensor pad when transmitting the capacitance signal, and wherein the electric field is capable of traveling to a surface of a substrate on the platform; and

detection circuitry connected with the analog-to-digital convertor, comprising a microprocessor executing pattern recognition and decision making algorithms, wherein the detection circuitry is for analyzing any change in capacitance of the first capacitive sensor by determining any change in the electric field and then determining if any fluid is present on a surface of a substrate on the platform.

14. The apparatus of claim 13, wherein both the transmit sensor pad and the receive sensor pad are mounted above the platform.

15. The apparatus of claim 13, wherein the first capacitive sensor is able to measure a change in capacitance of 100 pico-Farads or less, with a resolution of five femto-Farads or less.

16. The apparatus of claim 13, wherein the first capacitive sensor has a sample rate of at least 5 Hz.

17. The apparatus of claim 13, wherein the first capacitive sensor generates a fringing field between the transmit sensor pad and the receive sensor pad when transmitting the capacitance signal, wherein the fringing field extends out at least 2 millimeters from either the transmit sensor pad or the receive sensor pad.

18. The apparatus of claim 13, wherein a pad gap is formed between the transmit pad and the receive pad, and wherein the pad gap is less than 1 millimeter.

19. The apparatus of claim 18, wherein the pad gap forms an interdigitated finger pattern.

20. The apparatus of claim 13, wherein an array of capacitive sensors are mounted on the sensor board, wherein a length of the array is 100 mm or more.