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(54) Title: A METHOD FOR THE DETECTION OF DECAY OF HERMETICITY IN THE HERMETIC LOAD CELL AND A LOAD CELL USING PRESSURE SENSOR PRODUCED ACCORDING TO THIS METHOD

(57) Abstract: This invention is related to a method for the detection of deterioration of hermeticity in the load cells with hermetic feature used in the transformation of force into an electric signal in measuring devices such as weighbridge, scales etc. and thus for the control of the accuracy of the measurement values and is related to a load cell with pressure sensor produced according to this method.



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**A METHOD FOR THE DETECTION OF DECAY OF HERMETICITY IN THE HERMETIC
LOAD CELL AND A LOAD CELL USING PRESSURE SENSOR PRODUCED
ACCORDING TO THIS METHOD**

Technical Field

This invention is related to a method for the detection of deterioration of hermeticity in the load cells with hermetic feature used in the transformation of force into an electric signal in measuring devices such as weighbridge, scales etc. and thus for the control of the accuracy of the measurement values and is related to a load cell with pressure sensor produced according to this method.

Prior Art

The load cells that are used in the industry to measure weight are produced to be resistant to the external environment. Particularly the load cells that are used in truck scales are enclosed within a completely enclosed and sealed stainless steel outer container since they are subjected to external conditions such as rain, flood etc. Fluid inlet due to the external ambient conditions into the load cells is prevented by means of this and false measurement values of the load cells and decay of thereof from moisture is eliminated. However, since the thin metal membranes/layers located on the upper and lower parts of the load cells used today move constantly depending on the load on them, they can be deformed and broken by cracking in time due to usage. Also, there can be cracks and fractures in the load cell or thin metal membranes as a result of any impact under heavy working conditions. In this case, fluid inlet into the internal portion of the load cell occurs due to the external environmental conditions, thus this prevents the electronic circuit in the load cell from operating in a proper manner and sending the proper measurement value. Since there is no application for detecting the deterioration of the hermetic feature in the hermetic load cells with hermetic feature that are used today, fluid inlet into the load cell cannot be detected frequently and measurement is proceeded, although the measurement made is incorrect, it is believed to be correct by the users. As a result of the incorrect measurements which are made unconsciously in this manner, negative conditions are encountered such as damage to the buyer or seller depending on the area where the load

cell is used, penal sanctions due to loading the trucks over the determined limit. Today the hermetic containers which are used in the load cells are closed at atmospheric pressure and there is no pressure sensor in the internal portion of the hermetic container in order to control the air pressure within the hermetic container and to send this air pressure information to the electronic circuit.

Aim of the Invention

The aim of this invention is to determine the deterioration of the hermeticity in the load cell, thus the damage given to the hermetic container when problems such as cracking, perforation occur due to any reason by means of using a pressure sensor which measures the air pressure within the hermetic container which has a higher air pressure than atmospheric pressure or lower pressure than atmospheric pressure in the load cells with hermetic feature.

The aim of the invention is to transmit the information to the user when there are problems such as cracking, perforation etc. in the load cells with hermetic feature due to any reasons and when there is a probability of fluid inlet into the load cell depending on the external environmental conditions and to enable the users to intervene the damaged load cell immediately.

The aim of the invention is to prevent damage to the buyer or seller due to incorrect measurements depending on the fluid inlet to the load cell.

Description of Figures

Figure -1 is a view of the inventive product,
Figure -2 is a sectional view of the inventive product,
Figure -3 is a work flow of the inventive method

Reference Numbers in Figures

1. Load cell
2. Hermetic container
3. Pressure sensor
4. Electronic Card
5. Warning Unit

Description of the Invention

The load cell (1) subject to the present invention comprises a hermetic container (2) which is sealed under vacuum or high pressure, thus inner air pressure is higher or lower than the atmospheric pressure (not equal to the atmospheric pressure) and a pressure sensor (3) which is located within this hermetic container (2) and measures the air pressure in this hermetic container. In the inventive method, a hermetic container (2) which has higher or lower air pressure in the inner portion of the load cell (1) than the atmospheric pressure (not equal to the atmospheric pressure) is used, the air pressure value within the hermetic container (2) is measured by means of the pressure sensor (3) located within the hermetic container (2), this measurement is performed by to the electronic card (4), if an instantaneous pressure change occurs in hermetic container (2), it means that a problem such as cracking, perforation occurs in the hermetic container (2) for any reasons, in case the measured air pressure is equal to the atmospheric pressure the electronic card (4) detects this change and a warning is sent to the user after the deterioration of the hermeticity of the hermetic container is detected.

Since it is easily understood by means of the inventive method and the load cell (1) according to this method that the hermetic container (2) is perforated due to any reason, the user can be warned immediately in terms of the risk of fluid inlet into the hermetic container due to the external environmental conditions. The user is warned by means of the warning unit (5) and the warning unit (5) can comprise light and/or sound units connected to the electronic card (4) and/or signals that are sent by wired or wireless systems from the electronic card (4). The users who received the information about the perforation of the hermetic container (2) (loss of hermeticity feature) in the load cell (1) by means of the inventive method and the load cell (1) produced according to this method, can eliminate inaccurate measurement by means of performing the required repair or replacement processes by evaluating the high probability of incorrect measurement based on the fluid inlet to the hermetic container.

CLAIMS

1. A method for the detection of decay of hermeticity in the hermetic load cells,
5 characterized in that;
- using a hermetic container (2) whose inner air pressure is higher or lower than
the atmospheric pressure (not equal to the atmospheric pressure) in the load cell
(1),
- measuring the air pressure within the hermetic container (2) by means of the
10 pressure sensor (3) located within the hermetic container (2), transmitting this
measurement to the electronic card (4),
- detecting a pressure change in measured air pressure value via the electronic
card (4) and if the measured air pressure is equal with the atmospheric pressure,
15 sending warning to the user by means of the warning unit (5) after the deterioration
of the hermeticity of the hermetic container is detected.
2. A load cell (1) according to the method claimed in claim 1, characterized in that; it
comprises a hermetic container (2) whose inner air pressure is higher or lower than
the atmospheric pressure (not equal to the atmospheric pressure) and a pressure
20 sensor (3) which is located in this hermetic container (2) and measures the air
pressure within this hermetic container, transmits this to the electronic card (4).
3. A load cell (1) according to claim 1 or claim 2 characterized in that; it comprises an
electronic card (4) which detects the pressure change in the air pressure value
25 measured via the pressure sensor (3) within the hermetic container (2) with the
atmospheric pressure.
4. A load cell (1) according to claim 1 or claim 2 or claim 3, characterized in that; it
comprises a warning unit (5) which comprises light and/or sound units connected to
30 the electronic card (4) and/or the signals sent by the wired or wireless systems
through the electronic card (4) in order to warn the user.

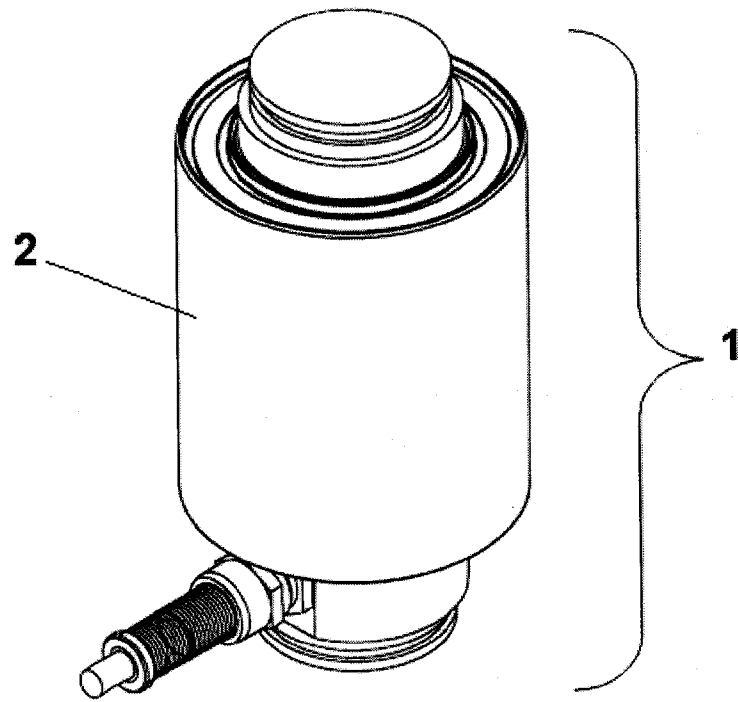


Figure-1

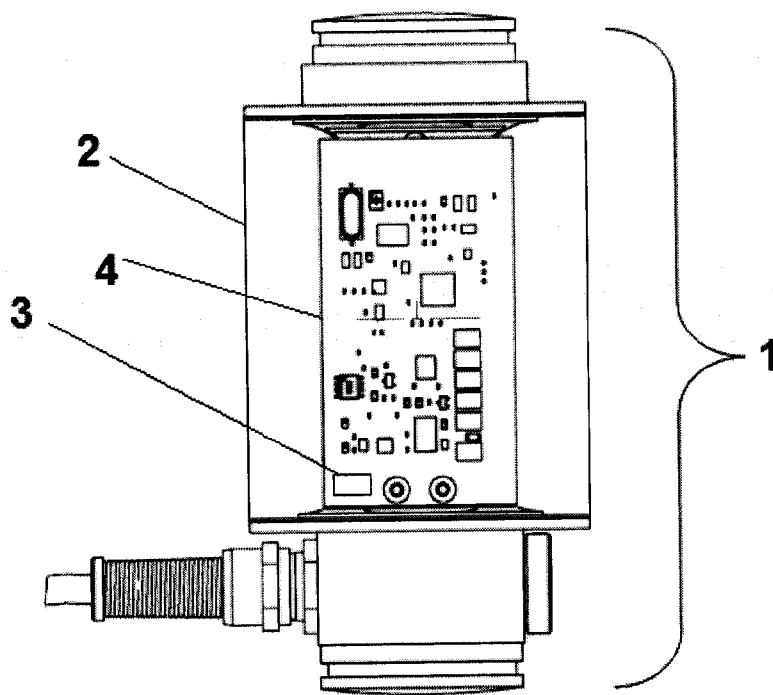


Figure--2

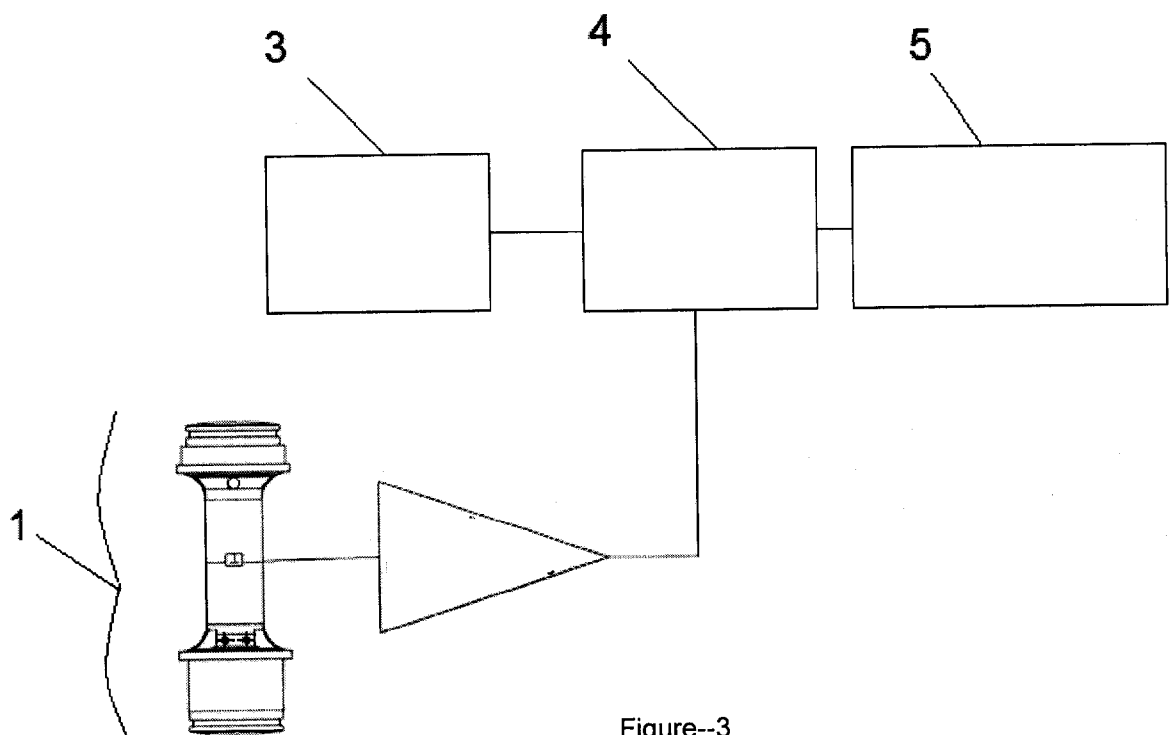


Figure--3