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Tartólemez elektródhoz

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmas az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

The present invention concerns a holding plate for an electrode, for example an ignition electrode or monitoring electrode, comprising a flat or
5 also more or less structured plate portion having a bore for receiving an ignition electrode in sealed relationship and fixing devices as well as a seal surrounding at least the ignition electrode for sealed fixing of the holding plate to a wall having an opening for the ignition electrode.

Corresponding holding plates are required for example for electrodes
10 which are fitted into the wall of a gas boiler, wherein the ignition electrodes serve to ignite a combustible gas when it is supplied thereto. Monitoring electrodes signal the presence of the flame.

In that situation the ignition electrodes are frequently fixed in sealed relationship in the holding plate so that the holding plate with the ignition
15 electrode mounted therein is of a sealed nature in itself. Such prefabricated parts which are provided from a holding plate equipped with an ignition electrode are generally bought-in parts which the manufacturers of gas boilers buy in ready-made condition and fit them to their respective burners. The outsides of the electrodes have corresponding electrical
20 connecting cables connected to a suitable power source which when required produces a voltage pulse which causes the ignition electrode to produce an ignition spark.

Modern boilers are more and more frequently in the form of condensing boilers which in their burner have a slightly increased pressure
25 of for example 0.2 bar. By virtue of that increased pressure the burner chamber or the outer housing with the exception of the air feed and the waste gas outlet opening must be of a sealed nature so that waste gases or indeed unburnt gases do not escape from the burner uncontrolledly. Ignition electrodes which are pre-mounted to holding plates therefore have
30 to be fixed in sealed relationship at a corresponding wall opening of the housing, through which the ignition electrode is passed. Conventionally that is done with sealing rings of silicone or also of metal which are fitted in position in the region between the wall of the housing and the holding plate

and which are clamped in position between the holding plate and the wall of the burner by screwing the holding plate firmly to the wall of the burner.

In that respect however it can happen that, because of inappropriate positioning of the seal, the holding plate warps when it is being screwed
5 firmly in place so that the seal is admittedly compressed particularly firmly between the holding plate and the wall of the burner at quite a few locations but at other locations however it is only slightly pressed in place or not at all and there are even certain intermediate spaces between the seal and the plate or the wall of the boiler.

10 For example corresponding holding plates have two or more fixing bores which are at a spacing from the electrode. If now such a seal between electrode and fixing bore runs too close to the fixing bore and then the holding plate is fixed in the region of the fixing bore by a screw which is tightened very greatly then the seal acts as a lever fulcrum and it can
15 happen that the holding plate is very firmly tightened against a housing wall on the side of the fixing bore, but in return on the side of the seal that is remote from the fixing bore, namely where the ignition electrode is disposed, it warps away from the boiler wall.

Because of the increased pressure in the boiler waste gas and in the
20 worst-case scenario even gas which has not yet been burnt can escape through such leaky regions.

Therefore the seal desirably has to be so arranged that as far as possible no warping due to corresponding lever forces occurs and the seal is substantially compressed or clamped in place between the holding plate
25 and the wall of the boiler with a uniform pressure force.

German laid-open application DE 33 33 698 A1 discloses a fixing device at the end of the jacket tube of a tubular heater arranged on a hot water tank, in which a thread shaped at the tube end projects. Shaped within the container on the jacket tube is a shoulder which is pressed in
30 sealed relationship against the wall of the hot water tank.

DE 94 15 187.3 U1 discloses a holder for an electrode comprising a plate portion having a bore receiving the electrode, wherein a ceramic body of the electrode is sealed with a seal against the holder. Sealing integrity

of the holder in relation to a wall on which the holder is disposed is not shown.

In comparison with that state of the art the problem of the present invention is to provide a corresponding holding plate with seal, in which
5 secure sealing integrity is better ensured and optionally excessive pressing on the seal material is avoided.

That problem is solved in that the holding plate is provided with an integrated seal.

The term "integrated seal" is used in accordance with the present
10 invention to mean that the holding plate with the seal is prefabricated, that is to say the seal is arranged correctly positioned in some fashion on the holding plate and is at least fixed to such an extent that it does not slip during mounting so that it always retains an optimum position ensuring that the holding plate, upon being fixed to the wall of a burner or boiler, is
15 not deformed and warped in such a way that leaks occur. The term "holding plate" is to be interpreted broadly and is intended to embrace all kinds of suitable, that is to say mechanically sufficiently robust, plate-shaped components, including comprising plastic or ceramic.

The fact that according to the invention the seal is integrated from
20 the outside with the holding plate, that is to say is arranged fixedly and durably on the holding plate, makes it possible to ensure that the seal remains in the correct, suitably selected position even during assembly, so as to ensure a uniform pressing pressure on the part of the holding plate against the seal.

In that case the seal can be for example applied over a large area to
25 the side of the holding plate, that is towards a corresponding boiler wall, and only the fixing bores and the region of the ignition electrode are cut out and observe a certain small spacing of a few (for example 2 - 8) millimeters relative to the outside edge and relative to the fixing bores and
30 the ignition electrode. Fitting a seal over a large area in that way prevents locally high pressing forces occurring and the seal is overall compressed uniformly between the holding plate and the wall of the boiler.

In another embodiment the seal can also be applied to the holding plate in the form of a strand or a "caterpillar", in particular being sprayed thereon or applied by printing. For example silicone seals can readily be sprayed on to a metal in the form of a "caterpillar" and then also adhere to the metal with a sufficient adhesive force so that such a seal does not slip. The seal can also be injected/glued/pressed into a groove.

According to a first embodiment it is provided that, in the case of a holding plate which besides an opening in which the ignition electrode is fixed in sealed relationship, also has still further fixing bores, there is a single seal which encloses both the ignition electrode and also the fixing bores.

Another embodiment provides that both the ignition electrode and also the fixing bores are respectively surrounded by annular seals of their own.

A preferred embodiment of the invention provides that the seals are provided in a peripherally extending groove, wherein the groove depth is markedly less than the thickness or height of the seal, measured perpendicularly to the plane of the holding plate. For example the groove depth is between 50 and 80% of the height or thickness of the seal. This means that the seal disposed in the groove projects on the open side of the groove markedly above the plane of the holding plate and in that way can be securely brought into engagement with an oppositely disposed wall of a boiler or the like, wherein the thickness of the seal, the dimensions of the groove and the sealing material can be such that the holding plate can be fixedly tightened with its fixing screws until for example the holding plate and the wall of the housing are in contact with each other, wherein in that condition the seal is compressed by a defined amount, namely precisely to the depth of the groove, and thus experiences a uniform pressing force which ensures good sealing integrity. The defined compression of the sealing material can thus be predetermined and ensures reliable sealing integrity and a long service life for the seal.

If a seal is used which cannot be applied by injection it can also be glued on to the holding plate or when using a metallic seal can also be soldered in position.,

Alternatively it would be possible to provide simple mechanical
5 holding devices, for example small tongues or projections which extend from the plate and hold the seal in position without adversely affecting the sealing engagement between the seal and the wall of a boiler or the like. For example a groove could be of a depth which is somewhat greater than half the diameter or the thickness of the seal, in which case the seal could
10 be so dimensioned that after insertion into the groove it bears against the groove wall with a slight stress. The seal could also be securely held in its desired position in that way.

Further advantages, features and possible uses of the present invention will be apparent from the description hereinafter of a preferred
15 embodiment and the related Figures in which:

Figure 1 shows a plan view of a holding plate member on the seal side,

Figure 2 shows a longitudinal section through the seal plate in Figure 1,

20 Figure 3 shows a longitudinal section through the holding plate fixed to a wall, and

Figure 4 shows various variants of seals on a holding plate.

Figure 1 shows a holding plate 1 in the form of a rectangular plate member with two fixing bores 3 extending therethrough and a central fixing
25 bore in which an ignition electrode 4 is accommodated in sealed relationship.

Figure 2 shows a longitudinal section through the holding plate 1 with the fixing bores 3 and the ignition electrode 4.

In addition both Figure 1 and Figure 2 show a peripherally extending
30 seal 2 arranged in a groove which is passed in an approximately elliptical shape jointly around the fixing bores 3 and the central bore with the ignition electrode 4. In particular Figure 2 shows the cross-section of the seal in the form of an asymmetrical trapezium which is arranged in a

groove in the holding plate and projects out of the groove with a sealing lip converging in a wedge-shaped configuration in cross-section.

5 The seal 2 can either be inserted or glued into the groove under a certain prestressing or it can also be injected into the groove with a nozzle which is of a suitable profile or it can have been applied for example by means of screen printing. In any event the seal 2 is sufficiently fixed in the groove in question so that it can be prefabricated in a finished condition as an integrated unit with the holding plate 1, delivered and handled, and in particular also mounted.

10 The sealed arrangement of the ignition electrode in the corresponding through bore in the holding plate 1 is in that respect not subject-matter of the present invention. As will be seen, the holding plate 1 is overall in the shape of a simple rectangular plate member, preferably comprising a metallic material like for example steel sheet. It may possibly
15 also involve a corrosion-protected plate which is either inherently corrosion-protected or has a suitable coating or surface treatment. Instead of a metal plate it is obviously also possible to use a suitable plastic or ceramic member. It will be appreciated that the holding plate can also be of any other shape.

20 Figure 3 shows the holding plate 1 in a condition of being fixed to the wall 5 of a boiler or the like by means of two fixing screws 6. The screws 6 are passed through the fixing bores 3 and either screwed into bores in the wall 5, provided with a suitable female thread, or screwed with suitable nuts from the inside of the wall which however are not shown here.

25 An additional sealing washer could also be selectively inserted between the screw head and the holding plate 1, in which case however the fixed engagement of the one smooth screw head with the top side of the plate is generally sufficient to ensure adequate sealing integrity at that location as this only involves preventing major leaks. If the threaded bores
30 for the fixing screws 6 in the wall of the boiler are in the form of blind holes the screws do not in any case themselves have to be sealed off.

When viewing the seal in Figure 1 it can be easily envisaged for example that, if the seal were not fixed in the illustrated fashion, it could

slip upon being inserted prior to fitment and could move in the proximity of one of the bores 3 but between the bore and the ignition electrode 4. Tightening of the adjacent screw could then have the result that the seal would admittedly be very strongly compressed in the region between the bore 3 and the ignition electrode, but at the same time would also function as a lever fulcrum so that the plate would be pressed very close to and firmly against the wall 5 on the side of the fixing screw in question, but at the same time in the proximity of the ignition electrode would possibly be warped so that the seal 2 could not adequately deploy its effect there.

Such detrimental effects are avoided by the fixing of the seal 2, according to the invention.

In that respect, the bore provided in the housing wall 5 for receiving the ignition electrode 4 could moreover be readily provided with a larger amount of play in order to be able to better compensate for tolerances in the arrangement of the various bores for the fixing screws and the ignition electrode.

Figure 4 shows two further variants of the arrangement of seals.

In the left-hand part of Figure 4 a seal illustrated by hatching is injected over a large area on to one side of the holding plate 2 or is applied for example by means of screen printing, in which case only the fixing bores 3 and the central bore for receiving the ignition electrode are left open. The outer edge regions of the rectangular holding plate are also not provided with the sealing layer.

A further alternative is shown in the right-hand part of Figure 4 in which each of the bores 3 in the holding plate for fixing screws and for the central electrode 4 is surrounded by its own sealing ring. This also ensures that, when the corresponding fixing screws 6 are tightened, all seals are compressed with substantially the same pressing force between the holding plate 1 and the housing wall 5 and thereby provide for secure sealing integrity.

As shown by the example of Figures 1 to 3 the seals 2 can be fitted into a groove or can be injected or glued into that groove, when using a metallic sealing material they could also be soldered into the groove.

Equally well however they could be injected or glued on to a smooth flat surface of a holding plate 1 which does not have a groove, in which case in the injection operation obviously only those sealing materials are considered which during the injection operation also develop a sufficient adhesive force to hold the seal 2 in its intended position in normal handling. In particular in Figure 4a the seal which covers a surface area is only applied by printing, injection or gluing to the holding plate.

Insofar as the burner-side surface has a corresponding opening the sealing material can serve at the same time for mutual orientation between the electrode and the burner. The sealing material is applied by injection in a suitably excessive amount and passes into the oppositely disposed groove. That gives a neater alignment and defined compression.

TARTÓLEMEZ ELEKTRÓDHOZ**Szabadalmi igénypontok**

1. Tartólemez elektródokhoz (4), amelynek lényegében sík, vagy kissé struktúrált, egy elektródot (4) tömítetten befogadó furattal és rögzítőeszközökkel (3, 6) rendelkező lemezrész, valamint egy legalább egy, az elektródot (4) körülvevő, a tartólemeznek (1) egy falhoz (5) tömítetten történő rögzítéséhez előírányzott tömítése van, amely fal a gyűjtőelektród felvételéhez, illetve befogadásához előírányzott nyílást tartalmaz, **azzal jellemezve, hogy** az elektródot körülvevő tömítés (2) a tartólemezbe (1) foglaltan, illetve azzal egy tagban van kialakítva.

2. Az 1. igénypont szerinti elektród, **azzal jellemezve, hogy** a tömítés (2) egy, a tartólemeznek (1) az elektródot körülvevő tartományára fel van szórva vagy rá van nyomtatva, illetve nyomva.

3. Az 1. igénypont szerinti elektród, **azzal jellemezve, hogy** a tömítés a tartólemeznek (1) egy, az elektródot (4) körülvevő tartományában fel van ragasztva vagy forrasztva.

4. Az 1. igénypont szerinti elektród, **azzal jellemezve, hogy** a tömítés egy zárt körbenfutó horonyban, illetve bemélyítésben van elrendezve, amelynek a mélysége kisebb, mint a tömítésnek (2) a lemez síkjára merőleges irányban mért vastagsága.

5. Az 1-4. igénypontok bármelyike szerinti elektród, **azzal jellemezve, hogy** a tömítés egy olyan tartományban van elrendezve, amely mind az elektródhoz előírányzott furatot, mind a tartólemezben (1) előírányzott rögzítőfuratokat (3) tartalmazza.

6. Az 1-4. igénypontok bármelyike szerinti elektród, **azzal jellemezve, hogy** több tömítés van előirányozva, amelyek egymástól elválasztva tartalmazzák az elektródhoz előirányzott furatot és további furatokat, például rögzítőfuratokat (3).

7. Az 1-6. igénypontok bármelyike szerinti elektród, **azzal jellemezve, hogy** a tömítés szilikonból, vagy lágy anyagból, illetve lágy fémötvözetből van.

8. Az 1. vagy 2. igénypont szerinti elektród, **azzal jellemezve, hogy** a tömítés „hernyó”-alakban van a tartólemezre felszórva.

9. Az 1-7. igénypontok bármelyike szerinti elektród, **azzal jellemezve, hogy** a tömítés nagy felületen, illetve nagyfelületűen van a tartólemez egyik oldalára felhordva.

10. A 9. igénypont szerinti elektród, **azzal jellemezve, hogy** a tömítés a tartólemez felületének legalább a 40%-át lefedi.

11. A 9. vagy 10. igénypont szerinti elektród, **azzal jellemezve, hogy** a tömítés lefedi az elektród (4) körüli és a rögzítőfuratok (3) körüli tartományt, valamint a rögzítőfuratok (3) és az elektród (4) közötti teljes tartományt.

A meghatalmazott:

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