

(19) **DANMARK**

(10) **DK/EP 2199010 T3**



(12)

Oversættelse af europæisk patentskrift

Patent- og
Varemærkestyrelsen

-
- (51) Int.Cl.: ***B 23 P 19/00 (2006.01)*** ***B 23 P 19/02 (2006.01)*** ***B 23 P 19/08 (2006.01)***
B 67 B 3/00 (2006.01) ***F 17 C 5/00 (2006.01)***
- (45) Oversættelsen bekendtgjort den: **2014-03-03**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2013-12-04**
- (86) Europæisk ansøgning nr.: **09178675.6**
- (86) Europæisk indleveringsdag: **2009-12-10**
- (87) Den europæiske ansøgnings publiceringsdag: **2010-06-23**
- (30) Prioritet: **2008-12-17 TR 200809549**
- (84) Designerede stater: **AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR**
- (73) Patenthaver: **Aygaz Anonim Sirketi, Büyükdere Caddesi No. 145/1 , Aygaz Han, Zincirlikuyu, Istanbul, Tyrkiet**
- (72) Opfinder: **Citil, M.Fevzi, Aygaz Anonim Sirketi, Buyukdere Caddesi 145/1, Aygaz Han Zincirlikuyu, 34394 Istanbul, Tyrkiet**
Tikiroglu, Can, Aygaz Anonim Sirketi, Buyukdere Caddesi 145/1, Aygaz Han Zincirlikuyu, 34394 Istanbul, Tyrkiet
Isbilen, Emrah, Aygaz Anonim Sirketi, Buyukdere Caddesi 145/1, Aygaz Han Zincirlikuyu, 34394 Istanbul, Tyrkiet
- (74) Fuldmægtig i Danmark: **GUARDIAN IP CONSULTING I/S, Diplomvej 381, 2800 Kongens Lyngby, Danmark**
- (54) Benævnelse: **Gummipakningsforseglingsautomatiseringssystem**
- (56) Fremdragne publikationer:
EP-A1- 0 780 191
EP-A2- 0 919 516
FR-A1- 2 683 295
FR-A1- 2 859 199
GB-A- 1 361 072
US-A- 2 380 068
US-A- 4 612 953

Gummipakningsforseglingsautomatiseringssystem**Description****Field of the invention**

5

[0001] This invention is related to a rubber gland seal automation system for automatic change of rubber gland seal which is between the valve and the regulator and which provides sealing on house type round gas cylinders that contain LPG.

10 **Background of the invention**

[0002] House type round gas cylinders are used to meet various needs. These cylinders are used in many applications such as furnaces, hot water boilers etc. Round house type bottled gas cylinders contain LPG. LPG is an odorless and colorless gas. But it is specifically odored in the refineries in order enable detection of leaks. It is a flammable gas which is heavier than air.

[0003] There is a valve named mini-valve on house type round gas cylinders. This valve is placed to the exit point of the gas on the cylinder and enables gas exit. There is a regulator on the valve. The regulator controls the gas flow by regulating the pressure of LPG in the tube.

[0004] The sealing between the valve and the regulator is provided by a seal named gland rubber. Gland rubber prevents leak of gas during gas flow between valve and the regulator. The gland rubber is very important in the system since it prevents gas leaks.

[0005] The gland rubber is worn in time due to use of the cylinder, removal and installation of the regulator and for some other reasons. This causes cracks on the gland rubber. These crack may cause LPG leaks. In order to prevent this, the gland rubber is changed each time a house type round gas cylinder is filled. Thus, leaks that may happen due to wear of the gland rubber are prevented.

[0006] Manpower is used when changing the gland rubber on a house type round gas cylinder. The cylinder moving forward on the conveyor belt is changed by labour. This not only increases the costs but also brings faults depending on the human factor.

[0007] The present techniques use similar systems mentioned above in order to change gland rubbers of house type round gas cylinders. There is no advanced automation system for changing the gland rubber faster and for minimizing the faults and costs. However, this invention enables minimizing the faults and costs and provides an automation system for changing the gland rubber of house type round gas tubes.

[0008] In French patent document no FR2859199 of the known state of the art, it is mentioned that the gas cylinders advancing on a conveyor belt are processed when passing from one section to another. These processes include a heating mechanism, a blow mold, capping mechanisms and a labeling system. The conveyor system is covered and fed by pressurized air, the arm that holds the cylinders comprises a pneumatic system.

[0009] Patent document EP0780191A1, which represents the closest prior art, discloses a seal installing machine preferably used on pressurized gas containers. According to this document, a sensor is used in order to determine the presence of seals on the gas containers. If a gas container does not comprise seal, an arm installs a seal to said gas container. This seal is more like a safety lid of the container, which provides a guarantee against violation of the contents unless it is destroyed. Similarly, document FR2683295A1 discloses a seal installation system for gas cylinders. However, neither of these documents discloses changing (or replacing) the gland rubber of the gas cylinder.

Brief description of the invention

[0010] The object of the invention is to provide a gland rubber automation system that enables reducing the costs and times and enables minimizing the faults when gland rubbers are being changed on cylinders moving forward on a conveyor line.

Brief description of the figures

[0011] A gland rubber developed to achieve the objects of this invention is shown in the amended figures, wherein;

Figure 1 - is a general view of the system's operation.

Figure 2 - is a view of the installation system.

Figure 3 - is a view of the removal system.

Figure 4 - is a view of the gland rubber.

[0012] Each part in the figures is given a reference number and these numbers refer to;

1. 1. Gland rubber automation system
2. 2. Installation system
3. 3. Feeding system
4. 4. Removal system
5. 5. Gland rubber chamber
6. 6. Gland rubber installation piston
7. 7. Gland rubber driving rail
8. 8. Cylinder centering head
9. 9. Cylinder centering piston
10. 10. Removal piston with protrusion
11. 11. Gland rubber
12. 12. Gas cylinder

Detailed description of the invention

[0013] In accordance with the invention, the objective is achieved in a gland rubber automation system according to claim 1. Advantageous modifications of the invention are objects of the dependent claims.

[0014] Nowadays the usage areas of house type round gas cylinders (12) are very common. These cylinders carry a risk due to the LPG gas that they contain. The gland rubber (11) between the valve and the regulator is changed each time the cylinders are filled for safety reasons. The gland rubber (11) is located between the valve and the regulator and prevents the gas from leaking out. Therefore it is one of the important components of the system. However, the gland rubber (11) is worn and cracks form on it in time due to reasons such as the regulator being removed and installed and the cylinder being filled. The gland rubber (11) should be changed since LPG can leak out from these cracks.

[0015] The gas cylinder (12) advancing on the conveyor belt reaches the first station where the removal procedure (4) is performed and the gas cylinder is centered by the centering piston (9). Here the cylinder centering head (8) which is a pneumatic arm descends on top of the cylinder (12) and centers the cylinder (12). The removal piston (10) has a structure with a protrusion. The removal piston (10) on top of the cylinder (12)

removes the gland rubber (11) from the mini-valve by the mechanism with protrusion. The mechanism with protrusion expands and holds the gland rubber (11) at multiple points and pulls up the held gland rubber (11) by using the pneumatic arm. Thus the gland rubber (11) is removed from the mini-valve. The protrusions are then closed and drop the old gland
5 rubber (11) into the accumulation tank located under the belt.

[0016] After the old gland rubber (11) is removed from the removal system (4) the centering piston (9) is opened and the cylinder (12) starts advancing on the conveyor belt. The cylinder (12) reaching the installation system (2) is centered again by the centering
10 piston (9). The new gland rubber (11) is installed onto the mini-valve in the installation system (2). The centering head (8) descends onto the fixed cylinder (12). The centering head (8) is guided by a conical jig. Thus the installation position of the new gland rubber (11) is precisely defined. The installation piston (6) installs the new gland rubber (11) to the mini-valve. Then the centering pistons (9) are opened and let the cylinder (12) advance on
15 the conveyor belt.

[0017] The installation system (2) is in relation with the feeding system (3). The feeding system (3) is comprised of the gland rubber chamber (5) where the new gland rubbers (11) are stored and the feeding rail (7). The feeding system (3) has a large capacity sufficient
20 enough for the system. The installation system (2) takes the new gland rubber (11) from the feeding system (3). The new gland rubber (11) is transferred from the exit point of the feeding chamber (5) to the mouth of installation piston (6) on the installation system (2) by a rail (7). Then the installation procedure is performed.

[0018] In light of these fundamental concepts, it is possible to develop various applications of "A Rubber Gland Seal Automation System" of the invention and the invention can not be
25 limited to the examples described herein and it is essentially as described in the claims.

PATENTKRAV:

1. Gummipakningsautomatiseringssystem (1) til automatisk udskiftning af gummipakningen (11), som er anbragt mellem ventilen og regulatoren på huslignende runde gascylindere, indeholdende LPG, og som forhindrer lækager, omfattende i sin basisform;
- et gummipakningskammer (5), som rummer de nye gummipakninger (11),
 - et installeringsstempel (6), som installerer den nye gummipakning (11),
 - en skinne (7), der fører gummipakningen (11) til installeringsystemet,
 - 10 - et centrerrhoved (8), som justerer gummipakningens (11) installerings- og udtagningsposition, når den nye gummipakning (11) installeres, og den gamle gummipakning (11) tages ud,
 - en gruppe af centrerstempler (9), som centrerer gascylinderen (12), når den nye gummipakning (11) installeres, og den gamle gummipakning (11) tages ud,
 - 15 - et installeringsystem (2), som installerer gummipakningen (11) på den centrerede gascylinder (12), og som omfatter og anvender gummipakningsinstalleringsstempellet (6), centrerrhovedet (8) og centrerstempellet (9) i kombination,
 - et tilførselssystem (3), som omfatter gummipakningskammeret (5), der indeholder de nye gummipakninger (11), og drivskinnen (7), som overfører gummipakningen (11) til
 - 20 installeringsstempellet (6), og som arbejder sammen med installeringsystemet (2),
 - et udtagningsystem (4), som omfatter udtagningsstempellet (10) med fremspring, og som udtager den gamle gummipakning (11).
2. Gummipakningsautomatiseringssystem (1) ifølge krav 1, **kendetegnet ved** et udtagningsstempel (10) med fremspring, hvilket udtagningsstempel udtager gummipakningen (11) ved at synke ned på miniventilen, og som holder og sammenpresser gummipakningen (11) ved hjælp af fremspringene.
3. Gummipakningsautomatiseringssystem (1) ifølge krav 1, **kendetegnet ved** et gummipakningskammer (5), der rummer de nye gummipakninger (11) og arbejder sammen med installeringsystemet (2).
4. Gummipakningsautomatiseringssystem (1) ifølge et hvilket som helst af de foregående krav, **kendetegnet ved** en gummipakningsdrivskinne (7), som tager gummipakningen (11) fra tilførselskammeret (5) og overfører den til munden af installeringsstempellet (6).
- 35

5. Gummipakningsautomatiseringssystem (1) ifølge et hvilket som helst af de foregående krav, **kendetegnet ved** et gummipakningsinstalleringsstempel (6), som modtager den nye gummipakning (11) via drivskinnen (7), og som installerer gummipakningen (11) på miniventilen.

5

6. Gummipakningsautomatiseringssystem (1) ifølge et hvilket som helst af de foregående krav, **kendetegnet ved** et gascylindercentrerstempel (9), som fikserer gascylinderen (12), der bevæger sig fremad på transportbåndet, når den når udtagnings- (4) eller installeringsystemet (2), og som derved muliggør en nem udtagning og installering af gummipakningen (11).

10

7. Gummipakningsautomatiseringssystem (1) ifølge et hvilket som helst af de foregående krav, **kendetegnet ved** et gascylindercentrerhoved (8), som synker ned på den centrerede cylinder (12), som præcist definerer gummipakningens (11) installeringsposition, og som muliggør, at installeringsstemplet (6) følgelig kan installere gummipakningen (11) i dens position.

15

Drawing

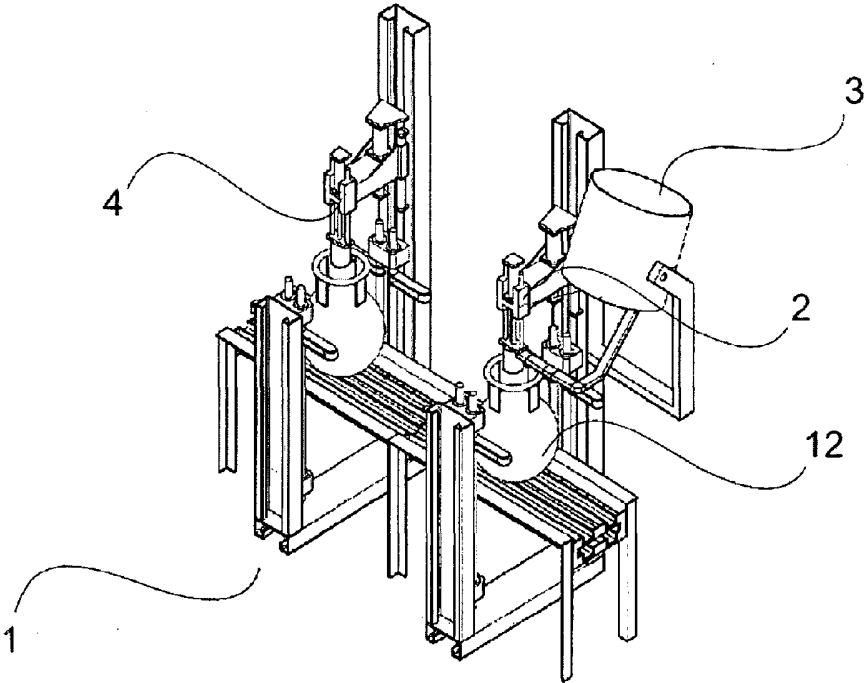


Figure 1

8

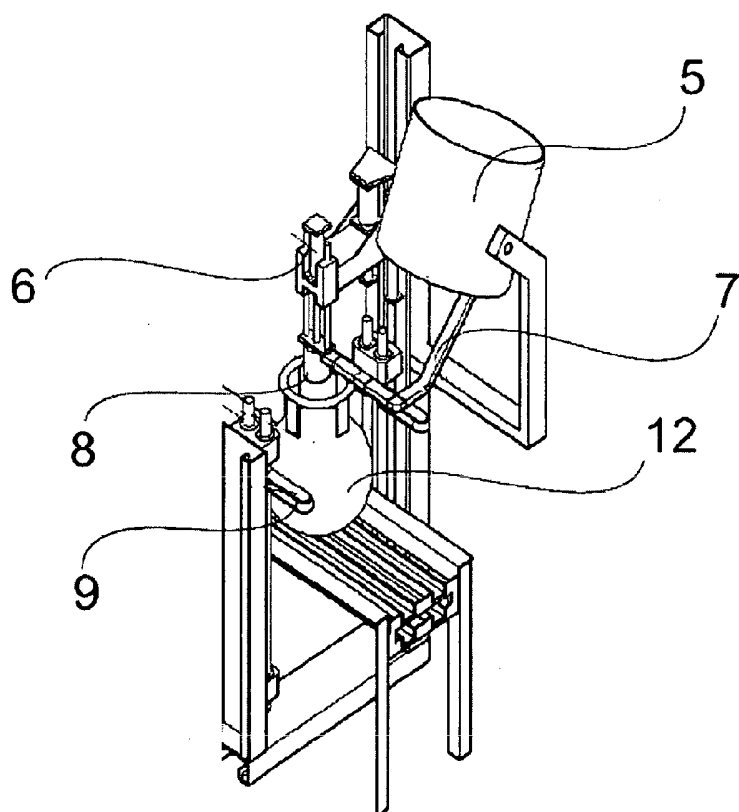


Figure2

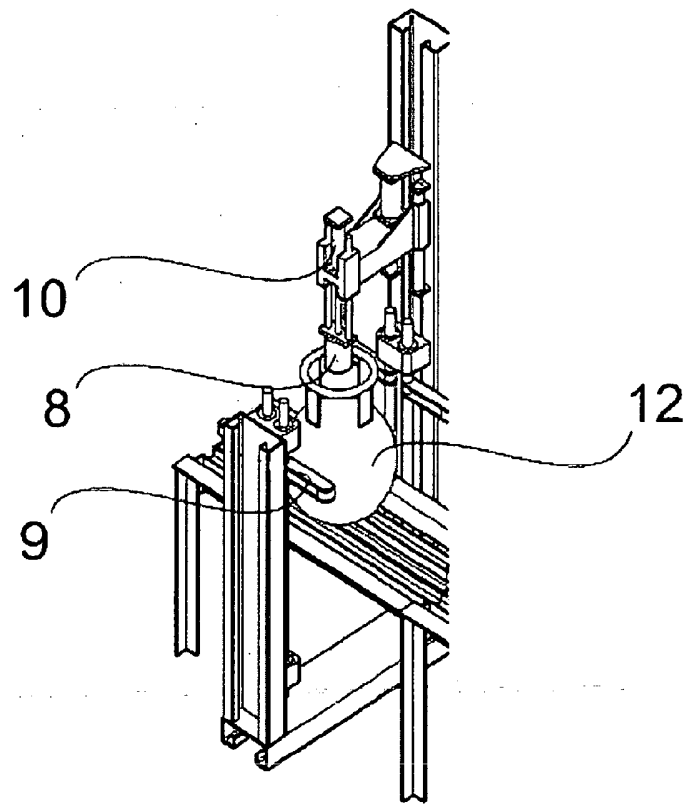


Figure3

10

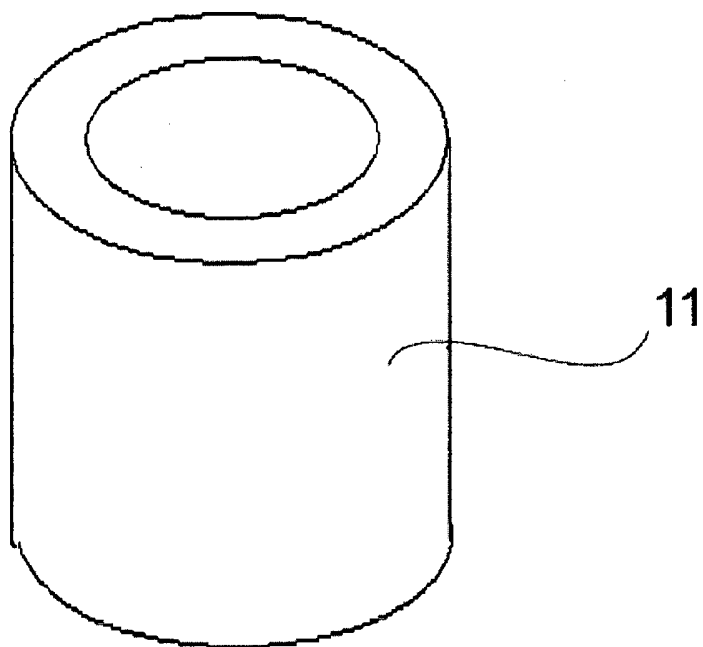


Figure 4