However, there are a wide variety of flanges and gaskets as objects, and it is inevitable to select a gasket fitting with a flange. In addition, the fastening procedure of a plurality of bolts is not uniform and, even in the case of using the fastening tool, a skilled worker is desirable for high reliable fastening. Training and experience are required for proficiency. A burden on the worker then becomes excessive and the flange fastening management is extremely rendered important.

[0007]

Thus, in view of the above problem, an object of the present invention is to consistently manage gaskets and fastening conditions from selection to execution by associating them to flanges, to thereby achieve high reliable flange fastening management and reducing the worker's burden.

SOLUTION TO PROBLEM

[0008]

In order to achieve the above object, according to an aspect of a flange fastening managing method of the present invention, in a flange fastening managing method, a computer as well as a fastening tool are used. The fastening tool fastens flanges with a gasket by a plurality of bolts and nuts. The gasket is sandwiched between the flanges. The method comprises the steps of: acquiring fastening condition information associated with the flanges; acquiring gasket information conforming to the flanges; collating the gasket information with gasket information representing a gasket to be used, to determine whether the gasket fits the flanges; and applying a fastening torque from the fastening tool to the bolts or the nuts under a fastening condition acquired from the fastening condition information when the gasket selected fits the flanges.

The flange fastening managing method further comprises the steps of acquiring the fastening torque applied from the fastening tool to the bolts or the nuts, to evaluate whether fastening of the flanges conforms to the fastening condition; and presenting fastening result information containing at least the fastening

example a synthetic resin case that comprises a case body 128 capable of accommodating the gasket 14 and a openable/closable lid 130 disposed on the case body 128. The lid 130 has a transparent window 132. The gasket 14 can visually be confirmed through the transparent window 132.

[0095]

The gasket case 126 comprises the gasket tag 44 having a disposed bar code 134. The bar code reader 86 reads the bar code 134, so that gasket tag information 136 can be acquired.

[0096]

The gasket tag information 136 contains the gasket information 92. This gasket tag information 136 stores, as shown in Fig. 9B, a gasket part No. and dimensions.

[0097]

<Fastening Result Information>

[0098]

Fig. 10A shows an example of the fastening result information. This fastening result information 138 contains a fastening condition 138-1, a fastening date and time 138-2, an error determination result 138-3, a first fastening result 138-4, and a second fastening result 138-5.

[0099]

The fastening result information 138 is specified by e.g. Line A as the fastening condition 138-1 and the applied point information. Individual bolt fastening conditions are stored. The fastening date and time 138-2 indicates a fastening date and time or time zone. The error determination result 138-3 indicates the determination result of whether or not the fastening status conforms to the fastening condition. The first fastening result 138-4 indicates a torque measurement value and the second fastening result 138-5 indicates a nut rotational angle.

[0100]

This fastening result information 138 contains, as the fastening result acquired from the fastening tool 4, both result

14 gasket
16 bolt
18 nut
20 device body
22 grip
23 socket
24 trigger
26 cable
28 front panel unit
30 input key
32 display unit
34 broken line
36 processing unit
38 input operating unit
40 monitor
42 flange tag
44 gasket tag
48 control unit
50 motor
52 torque sensor
54 trigger switch
56 rotational shaft
74 processor
76 storing unit
76-1 temporary storage area
76-2 storage area
78 input/output unit (I/O)
80 input operating unit
82 communicating unit
84 display unit
84-1 green lamp

84-2 red lamp
86 bar code reader
88 external memory
90 flange information
92 gasket information
93 worker tag
94 worker information
96 fastening condition table
96-1 line information part
96-2 flange information part
96-3 gasket information part
96-4 bolt information part
96-5 fastening condition information part
98, 98-1, 98-2 log information table
98-11, 98-21 line information part
98-12, 98-22 flange information part
98-13, 98-23 gasket information part
98-14 bolt information part
98-15, 98-25 fastening condition information part
98-16 fastening result information part
98-17, 98-27 worker ID part
98-28 fastening date and time part
98-29 error determination part
98-30 first round fastening result part
98-31 final round fastening result part
98-32 round number-of-times part
100 processor
102 storing unit
104 input/output unit (I/O)
106 communicating unit
108 touch panel
110 worker information table
110-1 ID part
110-2 company name part

CLAIMS

1. A flange fastening managing method in which a computer as well as a fastening tool are used, the fastening tool fastening flanges with a gasket by a plurality of bolts and nuts, the gasket being sandwiched between the flanges, the method comprising the steps of:

acquiring fastening condition information associated with the flanges;

acquiring gasket information conforming to the flanges;

collating the gasket information with gasket information representing a gasket to be used, to determine whether the gasket fits the flanges; and

applying a fastening torque from the fastening tool to the bolts or the nuts under a fastening condition acquired from the fastening condition information when the gasket selected fits the flanges.

2. The flange fastening managing method of claim 1, further comprising the steps of:

acquiring the fastening torque applied from the fastening tool to the bolts or the nuts, to evaluate whether fastening of the flanges conforms to the fastening condition; and

presenting fastening result information containing at least the fastening condition and a result of the evaluation in association with the flanges.

3. A flange fastening managing method in which a computer as well as a fastening tool are used, the fastening tool fastening flanges with a gasket by a plurality of bolts and nuts, the gasket being sandwiched between the flanges, the method comprising the steps of:

acquiring fastening condition information associated with the flanges;

claims 3 to 6, wherein

the flange information contains information indicative at least of a gasket fitting the flanges and of a fastening procedure.

8. The flange fastening managing method of any one of claims 3 to 7, wherein

the fastening condition information contains the flange information and the gasket information.

9. The flange fastening managing method of any one of claims 1 to 8, further comprising the steps of:

forming a gasket from a gasket material; and

attaching, to the gasket, the gasket tag containing information of the gasket.

10. A flange fastening managing system comprising:

a fastening tool that fastens a plurality of bolts and nuts attached to flanges, a gasket being sandwiched between the flanges;

a controller that controls a fastening action of the fastening tool; and

a server that is connected to the controller by wire or wireless, wherein

the controller acquires, from the server, fastening condition information associated with the flanges,

the controller acquires, from a flange tag, flange information containing gasket information conforming to the flanges and acquires gasket information from a gasket or a gasket tag,

the controller collates the gasket information contained in the flange information with the gasket information acquired from the gasket or the gasket tag,

the controller selects a fastening condition from the fastening condition information when the gasket fits the flanges,

the controller acquires a fastening torque applied from the fastening tool to the nuts, to evaluate whether fastening of the