that the tube is in. For example, the part of the tube with the marking is inside a machine and therefore the marking can not be read.

The present invention is directed to overcoming one or more of the problems as set forth above.

Summary

It is an object of the present invention to provide a tube~~, with one or more couplings~~, comprising a tag and a method for servicing such a tube ~~with one or more couplings~~. This object can be achieved by the features as defined in the independent claims. Further enhancements are characterized in the dependent claims.

According to one embodiment, a tube comprises a tag, the tag being configured to comprise tube service data and at least one more data of the following group of data: tube identification data, tube manufacture data, and tube operation data. The tag being configured to allow the data to be read, written, and updated electronically; and the tag is configured to provide data for servicing the tube. Such a tube comprises one or more couplings. The tag (30) is further configured to comprise data for servicing the one or more couplings (12, 14) and at least one more data of the following group of data: coupling identification data, coupling manufacture data, and coupling operation data. The tag (30) is further configured to provide data for servicing the one or more couplings (12, 14). The tag can be one or more tags. The tag may be a radio-frequency identification (RFID) tag or a near field communication (NFC) tag.

According to one embodiment, a method for servicing such a tube with one or more couplings is disclosed. The method comprises providing the tag on the tube; reading electronically the data from the tag for servicing the tube and the one or more couplings; servicing the tube and the one or more couplings according to the data read; and writing electronically data to the tag to update at least the tube service data.

At least one of the above embodiments provides that the tube can be serviced based on the data that the tube has on the tag. This allows a user of the tube to know, for example, when it is time for what kind of service of the tube and any couplings on the tube, and when the last service was made and its result. This

may result in a safer use of the tube and any couplings. It may allow a user the possibility to find out how to use the tube and couplings and what their technical and physical limitations are. Further advantages and technical effects of the embodiments are described below.

At least one of the above embodiments provides one or more solutions to the problems and disadvantages with the background art. Other technical advantages of the present disclosure will be readily apparent to one skilled in the art from the following description and claims. Various embodiments of the present application obtain only a subset of the advantages set forth. No one advantage is critical to the embodiments. Any claimed embodiment may be technically combined with any other claimed embodiment(s). WO 2010/106302 may be regarded as background art useful for understanding the invention.

Brief Description of the Drawings

The accompanying drawings illustrate presently preferred exemplary embodiments of the disclosure, and together with the general description given above and the detailed description of the preferred embodiments given below, serve to explain, by way of example, the principles of the disclosure.

FIG. 1 is a diagrammatic illustration of a tube according to an exemplary embodiment of the present disclosure.

FIG. 2 is a diagrammatic illustration of a tube according to an exemplary embodiment of the present disclosure.

Detailed Description

FIG 1 illustrates schematically a tube (10) with a coupling (12, 14) at each end. The tube (10) may be a pressurised tube (10). The pressure may be higher than the atmospheric pressure. For example, the tube (10) may be a high pressure tube (10) for several thousand times the atmospheric pressure~~, e.g. more than 350 bar~~. The couplings (12, 14) may be quick connect couplings (12, 14) allowing a fluid source to be connected to, for example, a tool by the tube (10). A cylinder (20) may be arranged around the tube (10). The cylinder may be slidable arranged on the tube (10). The cylinder (20) may comprise a tag (30). The tag (30) may be a near field communication (NFC) tag (30). While only one tag (30) is illustrated, the tube

According to one embodiment, the tube (10) may be a pressurised tube. The pressure may be higher than atmospheric pressure. For example, the tube (10) may be a high pressure tube (10) for several hundred or thousand times the atmospheric pressure. ~~For example, the tube and one or more couplings may be configured for more than 350 bar.~~

According to one embodiment, the tag (30) is arranged on a cylinder (20), the cylinder surrounding at least a part of the tube (10). The cylinder (20) may be in the shape and form of a sleeve. The cylinder (20) may be able to slide along the tube (10). The cylinder (20) may for example be a transparent piece of tube. The cylinder (20) may be part of a protective cover for the tube (10) that covers, for example, the entire length of the tube (10). The cylinder (20) may be limited by the couplings (12, 14) so that the cylinder (20) can not be removed from the tube (10). In this way the cylinder (20) is attached to the tube (10) by the tube (10) itself and the couplings (12, 14).

According to one embodiment, the tag (30) may be arranged on the inside of the cylinder (20). This arrangement is to protect the tag (30). In this way the tag (30) can be protected from the environment that the tube (10) is used in. In one embodiment, the tag (30) can be embedded in the cylinder (20). ~~In one embodiment, the tag (30) may be arranged to the tube (10) by the use of adhesive tape, pressure sensitive tape. The adhesive tape may be illustrated by feature (20) in FIGs 1 and 2.~~

According to one embodiment, the tag (30) and cylinder (20), or either the tag (30) or the cylinder (20), ~~or the adhesive tape,~~ comprise distinct visual text and/or markings. Such distinct visual text and/or markings may identify the tag (30) and inform, visually, a user of the existence of the tag (30). For example, the cylinder (20) may be made out of a fluorescent material. For example, the cylinder (20) may have a distinct colour, such a bright orange or red, so that it is easily noticed by a user of the tube (10). For example, the cylinder (20) may have a text written on it, such as "READ ME BEFORE USE", max pressure allowed, and/or expire date. By providing a distinct visual text or marking on the tag (30) or the cylinder (20) a user notice that there is important information and where it is.

A tube (30) and/or couplings (12, 14) comprising a tag (10) with such operation data may have one or more of the following technical effects. The tube and/or couplings are maintained properly, are tested when supposed to, safety regulations can be complied with, etc. A manual how to use and operate will always be present with the tube and/or coupling. Such information may be present in several different languages. Such an operation manual, and-or such as how to perform a test or connect the couplings of the tube, may be stored or linked on the tag as a movie or animation. A "read-these-instructions-before-use" can be created ensuring proper and safe use of the tube and/or coupling. The operation data is travelling with the tube and/or couplings. It is easy to read and work with the tag since equipment for reading and writing NFC tags are readily available.

According to one embodiment, a method for servicing a tube (10) and/or the at least one or more couplings (12, 14) is disclosed. The method may comprise the following steps, taken in any order:

providing the tag (30) on the tube (10);

reading electronically the data from the tag (30) for servicing the tube (10) ~~and/or the at least one or more couplings (12, 14)~~;

servicing the tube (10) ~~and/or the at least one or more couplings (12, 14)~~ according to the data read; and

writing electronically the data to the tag (30) to update at least the tube service data ~~and/or, preferably, the at least one or more couplings service data~~. Servicing the tube (10) ~~and/or the at least one or more couplings (12, 14)~~ may be done according to the data read and the instructions read. This makes it technically possible to service the tube and/or couplings because the data for servicing is available with the tube (10). The instructions, such as how and when, to do the service can be taken from the tube (10) via the tag (30). The results of the service can then be added to the tube (10). It may be possible to always check the tube (10) to ensure that the tube (10) is in order and complies with all its requirements. Further technical advantages from having service data, identification data, manufacture data, and/or operation data have been disclosed above.

According to one embodiment, reading and writing data to or from the tag (30) is done directly to the tag (30), or indirectly via the tag (30) to a remote

CLAIMS

1 A tube comprising a tag (30), the tag (30) being configured to comprise tube service data and at least one more data of the following group of data: tube identification data, tube manufacture data, and tube operation data;
the tag (30) being further configured to provide data for servicing the tube (10);
wherein the tube (10) further comprises one or more couplings (12, 14), and the tag (30) is further configured to comprise data for servicing the one or more couplings (12, 14) and at least one more data of the following group of data: coupling identification data, coupling manufacture data, and coupling operation data;
the tag (30) being further configured to provide data for servicing the one or more couplings (12, 14); and
the tag (30) being further configured to allow the data to be read, written, and updated electronically.

2 The tube according to claim 1, wherein the tag (30) is a radio-frequency identification (RFID) tag or a near field communication (NFC) tag.

3 The tube according to any one of the preceding claims, wherein the tube (10) is a pressurised tube.

4 The tube according to any one of the preceding claims, wherein the tag (30) is arranged on a cylinder (20), the cylinder surrounding at least a part of the tube (10) and able to slide along the tube (10).

5 The tube according to claim 4, wherein the tag (30) is arranged on the inside of the cylinder (20) to protect the tag (30).

~~6 The tube according to any one of the preceding claims, wherein the tag (30) is arranged on an adhesive tape and the adhesive tape is arranged on the tube (10).~~

~~7~~6 The tube according to any one of the preceding claims, wherein the tag (30), and/or cylinder (20), ~~and/or adhesive tape,~~ comprises distinct visual text and/or markings.

~~8~~7 A method for servicing a tube (10) with one or more couplings (12, 14) according to any one of the preceding claims 1 to 7, the method comprising:

providing the tag (30) on the tube (10);

reading electronically the data from the tag (30) for servicing the tube (10) and the one or more couplings (12, 14);

servicing the tube (10) and the one or more couplings (12, 14) according to the data read; and

writing electronically data to the tag (30) to update at least the tube service data.

~~9~~8 The method according to claim ~~8~~7, wherein the tube and coupling service data is one or more data of the following group: data relating to optical inspection, data relating to physical tests, data relating to pressure tests, time of optical inspections, result of optical inspections, time of physical tests, a certificate ensuring that a pressure test has been made and its result, and result of physical tests.

~~10~~9 The method according to anyone of the preceding claims ~~8~~7 or ~~9~~8, wherein the tube and coupling identification data being one or more data of the following group: what tube it is, what coupling it is, product number and/or identification, expiry date for the tube, expiry date for the coupling, maximum pressure allowed, what kind of fluid allowed, length and diameter of the tube, information concerning threaded connections to the tube, and peripheral connections.

~~11~~10 The method according to anyone of the preceding claims ~~8~~7 to ~~10~~9, wherein the tube and coupling manufacturing data is one or more data of the following group: when the tube and the coupling was made, where the tube and the coupling was made, who has manufactured the tube and the coupling, batch number of the tube and coupling, where to order a new replacement tube and coupling, how to

order a new replacement tube and coupling, a certificate ensuring the manufacturing specification, and how to contact the manufacturer.

~~12~~11 The method according to anyone of the preceding claims ~~8~~7 to ~~11~~10, wherein the tube and coupling operation data is one or more data of the following group: a manual or instructions how to operate the tube and couplings, how to service the tube and coupling, how to do visual inspection, how to do physical tests, how to do pressure testing, how to identify damages, how to record it on the tag, information, manufacture contact information, how to get further information, how to get help concerning the tube and coupling, links to URL addresses, movies or animations of this operation data, and this operation data in different languages.

~~13~~12 The method according to anyone of the preceding claims -~~8~~7 to ~~12~~11, wherein reading and writing data to or from the tag (30) is done directly to the tag (30), or indirectly via the tag (30) to a remote memory.

13 A tube as described herein with reference to the description and/or the drawings.

14 A method of servicing a tube as described herein with reference to the description and/or the drawings.