

PATENT SPECIFICATION

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(54) HIGH PRESSURE GAS SUPPLY APPARATUS

(71) We, SUBMARINE AND SAFETY ENGINEERING LIMITED, a British company, formerly of Daux Road, Billingshurst, Sussex, now of Industrial Estate, Bognor Regis, Sussex, do hereby declare the invention, for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to high pressure gas supply apparatus and may advantageously be applied to portable breathing apparatus.

Breathing apparatus is commonly arranged to be carried by harness on the back 15 of the user and comprises a gas cylinder with a valve for controlling the discharge of breathing gas. Breathing gas is commonly stored at high pressure, typically of the order of 3,000 p.s.i. This pressure must be reduced to say 90 p.s.i. 20 before it is fed to the demand valve regulator of the breathing apparatus. Commonly a reducing valve is attached directly to the valve outlet of the cylinder and since the gas is still under high pressure the connection may be 25 made with a BS 341 PT 2 — TYPE "A" fitting, for example. If the reducing valve is made rigid with the pressure cylinder and its valve, sudden impact may cause damage to the apparatus. Furthermore, the disposition of the 30 service hoses may be inconvenient for the user.

High pressure gas supply apparatus according to the present invention includes a supply cylinder having a valve outlet leading to an 35 internally screw-threaded socket, a plug having an externally screw-threaded first end for engagement with the internally screw-threaded socket of the cylinder valve and having an axial bore extending from the said 40 first end partway along the plug length and

communicating through a radial bore with an annular channel in the plug surface, in combination with a tubular member terminating in a ring which encircles the plug at the said annular channel, sealing means being provided on each side of the annular channel 45 between the plug body and the ring, the tubular member communicating through an aperture in the ring with the said annular channel to form a rotary coupling therewith. 50 The plug and ring of such apparatus thus provides a swivel connection between the cylinder outlet and a reducing valve, for example, and therefore permits swivelling motion of the 55 reducing valve and a hose connected thereto with respect to the cylinder and plug.

In order that the invention may be better understood, an example of apparatus embodying the invention will now be described with reference to the accompanying drawing. 60

In the drawing, an externally screw threaded plug 1 has a standard sealing arrangement 2 to suit a BS 341 TYPE "A" cylinder valve outlet, although it may be made to suit an alternative outlet if desired. The plug has a stepped 65 central bore 3 in which is located a filter 4. The bore 3 extends into the rear portion of the plug in which is formed a cross bore 5 communicating with an annular channel 6. Annular grooves 7 and 8, one on each side of 70 the channel 6 house O-rings for sealing the plug to a banjo connector 9 having a bore 10 communicating with the annular channel 6. The banjo connection may form an integral part of a subsequent air system, in this case 75 the reducing valve, or may be simply a connector for a hose, for example.

As shown in the drawing, the plug screws directly into the internally screw-threaded outlet 11 of the cylinder valve. Wings 12 per- 80

mit hand tightening of the plug; alternatively, a knurled knob may be provided.

In the example shown the plug is first pushed through the ring of the banjo connector and is then screwed into the cylinder socket, the ring of the connector being located between the end of the cylinder valve socket 11 and a shoulder 13 on the plug. It will be clear that other arrangements are possible; for example, the plug may be formed with a locating shoulder for locating the side of the ring nearest to the cylinder socket, so that the ring of the banjo connector may be placed over the plug when the latter has been screwed into the cylinder socket, a further locating device being fixed in plate on the side of the ring remote from the cylinder socket, to hold the ring in position.

WHAT WE CLAIM IS:-

1. High pressure gas supply apparatus including a supply cylinder having a valve outlet leading to an internally screw-threaded socket, a plug having an externally screw-threaded first end for engagement with the internally screw-threaded socket of the cylinder valve and having an axial bore extending from the said first end partway along the plug length and communicating through a radial bore with an annular channel in the plug surface, in combination with a tubular member terminating in a ring which encircles the plug at the said annular channel, sealing means being provided

on each side of the annular channel between the plug body and the ring, the tubular member communicating through an aperture in the ring with the said annular channel to form a rotary coupling therewith.

2. Apparatus in accordance with claim 1, in which the plug is provided with a filter.

3. Apparatus in accordance with claim 1 or 2, in which the tubular member is part of the body of a reducer valve.

4. Apparatus in accordance with claim 1 or 2, in which the tubular member is a hose.

5. Portable breathing apparatus including high pressure gas supply apparatus in accordance with any one of the preceding claims.

6. High pressure gas supply apparatus, substantially as herein described with reference to the accompanying drawing.

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15 into the cylinder socket, a further locating device being fixed in plate on the side of the ring remote from the cylinder socket, to hold the ring in position.

WHAT WE CLAIM IS:-

20 1. High pressure gas supply apparatus including a supply cylinder having a valve outlet leading to an internally screw-threaded socket, a plug having an externally screw-threaded
25 screw-threaded socket of the cylinder valve and having an axial bore extending from the said first end partway along the plug length and communicating through a radial bore with an annular channel in the plug surface, in combination with a tubular member terminating
30 in a ring which encircles the plug at the said annular channel, sealing means being provided

on each side of the annular channel between the plug body and the ring, the tubular member communicating through an aperture in the ring with the said annular channel to form a rotary coupling therewith. 35

2. Apparatus in accordance with claim 1, in which the plug is provided with a filter.

3. Apparatus in accordance with claim 1 or 2, in which the tubular member is part of the body of a reducer valve. 40

4. Apparatus in accordance with claim 1 or 2, in which the tubular member is a hose.

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