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- (54) Benævnelse: **Hane til tryksat fluid/væske, og beholder forsynet med sådan hane**
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This invention relates to a valve for pressurised fluid as well as a reservoir provided with such a valve.

The invention more particularly relates to a valve for pressurised fluid, with or without an incorporated pressure-reducing valve, comprising a body housing a fluid circuit having an upstream end intended to be placed in communication with a supply of pressurised fluid and a downstream end intended to be placed in communication with a device that uses said fluid, the circuit comprising an isolation valve for selectively closing off the circuit, the valve being controlled by a lever mounted so as to be able to pivot on the body between a rest position wherein the isolation valve is held in a position for closing the circuit and an active position wherein the lever moves the isolation valve into a position for opening the circuit.

The invention relates in particular to valves for pressurised fluid, in particular pressurised gases, comprising a manual control member of the pivoting lever type.

Document EP1421305B1 describes a valve in accordance with the preamble of claim 1.

Non-restricted examples of such valves are described in documents EP747796 or EP1421305.

Document US3035605 describes a valve with a pivoting lever for controlling a gate wherein an end of the lever in the shape of a fork is straddled over filling/extracting connection that in order to allow a nut then fastened on the connection to block the lever in closed position.

Document FR2865263A1 describes a valve provided with a U-shaped bracket pivoting around a mobile cap arranged around the valve. The movement of the bracket is authorised according to the position of the cap in order to control a gate of the valve.

The inventors have striven to constantly improve the technical solutions for users of valves for pressurised fluid.

In particular, it is desirable to have valves for pressurised fluid that maintain or increase the number of
5 functions without increasing the volume or the encumbrance thereof (and more preferably by decreasing the encumbrance or volume thereof). Indeed, ideally, the valves must be able to adapt to the sizes and shape of various protective caps.

Furthermore, the increase in the solidity and/or of the
10 safety of such devices is always desired.

A purpose of this invention is to improve at least partially some of the characteristics of valves for pressurised fluid. This purpose is achieved in accordance with claim 1.

15 According to a possibility, when the lever is in at least one of the positions among: the active position, the rest position or an intermediate position between these two positions, the opening receives therein a portion of the body of the valve and/or a portion of a functional member mounted
20 on the body of the valve.

The invention as such makes it possible to improve the compactness of the valve and, where applicable, provide additional protection of the valve.

According to other possible particularities:

25 - the valve comprises a member for measuring a physical parameter of the fluid in the circuit, the measuring member comprising a display, with the opening of the lever having a shape that matches the display of the measuring member, when the lever is in the active position thereof or an intermediate
30 position between the active position and the rest position, at least one portion of the display of the measuring member is accommodated in the opening of the lever, i.e. the display

is surrounded at least partially by the body of the lever and is incorporated in the volume of the lever,

- the measuring member is a manometer indicating a pressure or a content,

5 - the lever comprises one or more reinforcements forming cross members between two ends of the opening,

- when the lever is in at least one of the active or rest positions, at least one so called "bearing" portion of the lever interacts in abutment with the body of the valve in such

10 a way as to limit the movement of the lever,

- an end of the lever is articulated on the body and at least one bearing portion of the lever is located close to the axis of articulation of the lever,

- at least one bearing portion of the lever is located

15 close to the end of the lever which is opposite the axis of articulation,

- the opening is circular, oval, square, rectangular or parallelepipedal and is located close to one end of the lever,

- the lever is comprised of a plastic material and/or of

20 a moulded metal material,

- the lever is comprised of a pressed metal material.

The invention also relates to a reservoir of pressurised fluid comprising a valve in accordance with any one of the characteristics hereinabove or hereinafter.

25 Other particularities and advantages shall appear when reading the description hereinafter, given in reference to the figures wherein:

- figure 1 shows a perspective view, diagrammatic and partial, showing a possible example of a valve for pressurised

30 gas according to the invention mounted in the neck of a bottle of pressurised fluid,

- figure 2 shows a diagrammatic and side view of a detail of figure 1, showing the structure and the operation of a lever pivoting in order to actuate a valve,

- figure 3 shows a perspective view of a detail of another possible embodiment of a valve lever according to the invention.

The valve shown by way of a non-restricted example in figure 1 comprises a body 1 comprising a threaded base 14 mounted in the orifice of a tank 12 of pressurised gas. The body 1 houses a circuit 2 for extracting the fluid having an upstream end 3 intended to be placed in communication with the storage volume of a reservoir 12 of pressurised fluid and a downstream end 4 intended to be placed in communication with a device that uses said fluid.

The downstream end 4 of the circuit 2 can open into an outlet connection 13 intended to be connected to a pipe and/or a device that uses gas supplied by the valve. The valve can where applicable comprise a separate connector 13 for filling provided with a valve (not shown) that makes it possible to inject gas into the reservoir 12 via a circuit internal to the valve (separate or partially shared with the extraction circuit 2).

Conventionally, the extraction circuit 2 can comprise control members such as a pressure-reducing valve, a residual pressure valve, etc.

The extraction circuit 2 comprises in particular an isolation valve 5 (cf. diagrammatically in figure 2) making it possible to selectively interrupt the passage of the gas. In the case where the valve incorporates a pressure-reducing valve, the valve 5 can be arranged upstream or downstream of the pressure-reducing valve.

The valve also comprises a manometer 7 that measures the pressure in the extraction circuit 2, for example upstream of the valve 5.

The valve can also comprise a thumbwheel 15 in order to manually control the flow rate and/or the pressure delivered by the valve.

The valve 5 is controlled by a lever 8 mounted so as to be able to pivot on the body 1 of the valve between a rest position wherein the isolation valve 5 is held in a position for closing of the circuit 2 (solid lines in figures 1 and 2) and an active position wherein the lever 8 moves the isolation valve 5 into a position for opening the circuit 2 (cf. dotted lines in figure 2).

For example, the rotation of the lever 8 selectively actuates a push-valve member 16.

For example, in the rest position thereof, the lever 8 is positioned against or along the body of the valve 1, preferably in a stable position.

In the active position thereof (preferably stable), the lever 8 is for example shifted by a non-zero angle relative to the rest position.

In this non-restricted example, the lever 8 is articulated (axis 11) on one of the ends thereof and, in rest position, the free end of the lever 8 is oriented towards the base 14 of the valve. Of course, this configuration is in no way restricted. For example, it is possible to consider a rest position with the lever 8 oriented opposite the base (upwards), or according to any direction (towards the side) and any suitable determined angle. Likewise for the active position which can be defined according to any other orientation and angle with respect to the body 1.

According to an advantageous particularity, the lever 8 comprises at least one opening 6 and, when the lever 8 is in

the rest position thereof, the opening 6 receives therein at least a part of the manometer 7.

That is to say that the manometer 7 (at least a portion of the display thereof) enters the volume of the lever 8.

5 This configuration makes it possible to increase the compactness of the whole. In addition, the lever 8 as such provides additional protection of the manometer 7 but also of the user of the valve. In position around the manometer 7, the lever 8 forms an additional protective frame for the manometer
10 7 protecting it from direct or direct impact, without required additional parts. In addition, this frame formed by the lever 8 also forms a strapping for maintaining the manometer in case of failure of the latter (in case for example of a risk of ejection of the manometer 7 subjected to the high pressure).

15 This makes it possible to increase the reliability and the service life of the whole.

Of course, the invention is not limited to this embodiment.

As such, it is possible to consider an alternative or
20 cumulative configuration wherein, when the lever 8 is in the active position thereof, the opening 6 receives therein another portion of the body 1 of the valve and/or a functional member mounted on the body 1 of the valve.

Likewise, alternatively or cumulatively, it is possible
25 to consider a configuration wherein during an intermediate position of the lever 8 (when it is moved between the rest and active positions thereof), the opening 6 passes around at least one portion of the body 1 of the valve and/or of a functional member mounted on the body 1 of the valve.

30 This makes it possible to increase the compactness of the whole.

In the example described, the opening 6 is circular and matches the circular shape of the manometer 7. Of course, the

shape and/or the orientation of the opening 6 can be different and complementary with any other shape of any other member of the valve (flow meter, selector member with floater, temperature sensor, etc.).

5 Likewise, the opening 6 can be carried out through a cut and/or one or more folds or curvatures of the lever 8.

As such the opening 6 can be delimited by a closed contour as shown in the figures. Of course, alternatively the opening 6 can be delimited by an open contour, i.e. for example by a
10 strapping of the material which is closed on itself (for example in the manner of the loop of a question mark).

As shown in figure 2, when the lever 8 is in the rest position thereof, at least a so-called "bearing portion 10 of the lever 8 interacts in abutment with the body 1 of the valve
15 in such a way as to limit the movement of the lever 8 towards the body 1.

The bearing portion 10 of the lever 8 is for example located close to the axis 11 of articulation of the lever 6. Of course, a similar bearing portion could be provided on the
20 free end of the lever or in the median portion thereof. This makes it possible to further strengthen the resistance of the whole as the bearing can where applicable limit the deformation of the lever 8 in case of more substantial impacts.

In the alternative of figure 3, the lever 8 comprises one
25 or more reinforcements 9 forming cross members between the ends of the opening 6. These reinforcements 9 form additional protection (impacts, ejections) of the manometer 7 without excessively affecting the continuous reading of the face of the manometer 7.

30 As shown in figure 2, the free end 116 of the lever 8 can comprise a narrowed shape that limits the possible risks of catching the finger of a user during the manipulation.

Preferably, when the opening 6 of the valve receives therein a portion of the body of the valve and/or a portion of a functional member there is no mechanical catching between the opening 6 and the portion received.

5 It is as such easily conceived, while still being of simple structure and inexpensive, that the structure object of the invention makes it possible to improve the compactness and where applicable the robustness of the valve.

The invention can also concern any alternative device or
10 method comprising any combination of the characteristics hereinabove.

Patentkrav

1. Hane til tryksat fluid, med eller uden en inkorporeret tryk-reduceringsventil, omfattende et legeme (1) der indeholder et flydende kredsløb (2) med en opstrøms ende (3) der er beregnet til at blive bragt i kontakt med et forråd af tryksat fluid og en nedstrøms ende (4) der er beregnet til at blive bragt i kontakt med et brugerapparat, hvor kredsløbet (2) omfatter en isolationsventil (5) til selektivt at lukke kredsløbet (2), ventilen (5) styres af en arm (8), der er monteret så den er i stand til at dreje på legemet (1) mellem en hvileposition i hvilken isolationsventilen (5) er holdt i en position til lukning af kredsløbet (2) og en aktiv position hvor armen (8) bevæger isolationsventilen (5) til en position til åbning af kredsløbet (2), ventilen omfatter et funktionselement (7) monteret på ventilens legeme og udgøres af et element (7) til måling af en fysisk størrelse af fluid i kredsløbet (2), elementet til måling er et manometer der indikerer et tryk eller et indhold, og elementet (7) til måling omfatter et display **kendetegnet ved** at armen (8) omfatter en åbning (6) afgrænset af en lukket eller åben kontur med en cirkulær form konjugeret af den cirkulære form af elementets display til måling (7), og ved at, når armen (8) er i hvileposition, er armen (8) positioneret mod eller langs ventilens (1) legeme, foran displayet, i denne hvileposition, og åbningen (6) er anbragt foran displayet for at tillade kontinuerlig læsning af displayet.

2. Ventil ifølge krav 1, **kendetegnet ved at** armen (8) er hængslet på en akse (11) ved en af sine ender, og i hvilestillingen er den frie ende af armen (8) orienteret mod basis (14) af ventilen.

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3. Ventil ifølge krav 2 **kendetegnet ved at** i sin aktive position er armen (8) forskudt en ikke-nul-vinkel i forhold til hvilepositionen.

4. Ventil ifølge et hvilket som helst af kravene 1 til 3 **kendetegnet ved at** i hvilestillingen samvirker mindst en anlægsdeldel (10) af armen (8) i mod ventilens legeme (1) på en sådan måde at bevægelsen af armen (8) mod legemet (1) begrænses.

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5. Ventil ifølge et hvilket som helst af kravene 1 til 4, **kendetegnet ved at** når armen (8) er i den aktive position, samvirker mindst en anlægsdel (10,116) af armen (8) i stødende op til med ventilens legeme (1) på en sådan måde at bevægelsen af armen (8) begrænses.

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6. Ventil ifølge krav 2 eller 3, **kendetegnet ved at** en ende af armen (8) er hængslet på legemet (1) og ved at mindst en anlægsdel (10) af armen (8) er anbragt tæt ved hængselaksen (11) af armen.

10 7. Ventil ifølge et hvilket som helst af kravene 2 til 6, **kendetegnet ved at** mindst en anlægsdel (116) af armen (8) er anbragt tæt til enden af armen (8) der modsat hængselaksen (11).

15 8. Ventil ifølge et hvilket som helst af kravene 1 til 7, **kendetegnet ved at** den cirkulære åbning (6) er anbragt tæt ved en ende af armen (8).

9. Ventil ifølge et hvilket som helst af kravene 1 til 8, **kendetegnet ved at** armen (8) er fremstillet af et plastmateriale og/eller af støbt metalmateriale.

20 10. Ventil ifølge et hvilket som helst af kravene 1 til 9, **kendetegnet ved at** armen (8) er fremstillet af presset metalmateriale.

25 11. Ventil ifølge krav 1 eller 10, **kendetegnet ved at** armen (8) omfatter en eller flere forstærkninger (9) der danner tværelementer mellem to ender af åbningen (6).

12. Beholder til tryksat fluid omfattende en ventil, **kendetegnet ved at** ventilen er ifølge et hvilket som helst af kravene 1 til 11.

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