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DESCRIPTION

The invention relates to a protective cap, a reservoir comprising such a cap and method for mounting same.

- 5 DE10308676 A1 discloses such a cap.

The invention relates more particularly to a protective cap for a pressurised-fluid reservoir tap comprising two half shells connected to each other, the two half shells defining a bottom base intended to be mounted at an orifice of a reservoir, in particular around a reservoir neck, the two half shells being assembled on a plane perpendicular to the base and defining
10 a protective interior volume for a tap, the two half shells being assembled by securing-spindle systems cooperating with housings formed in the half shells, the two half shells defining, in the assembled position, at least one opening for access to the protective interior volume, the cap furthermore comprising, at a top end of the cap, a connecting piece comprising two ends attached respectively on the two half shells by snapping on.

- 15 A protective cap for a pressurised-fluid bottle tap must satisfy several technical constraints. The protective cap must provide effective mechanical protection for the tap while having reduced mass, good ergonomics of access to the tap and ease of gripping and handling as well as ease of mounting.

The documents EP939875A1 and WO 2007/125240 each describe for example such a
20 protective cap. However, this type of cap offers a limited number of functionalities. Moreover, this type of cap can present safety problems if the cap were to become dismantled by careless users. In addition, some impacts may damage the strength of this cap in two assembled parts.

The document EP2715209A1 describes a cap, the two parts of which are assembled by
25 means of a connecting beam forming a gripping handle. Mounting such a cap is however difficult for an operator, who must assemble these various parts and mount the assembly on a reservoir already provided with a tap. In addition, the structure of such a cap requires a large number of parts and may be incompatible with certain forms of tap.

- One aim of the present invention is to overcome all or some of the abovementioned
30 disadvantages of the prior art.

For this purpose, the cap according to the invention, moreover in accordance with the generic definition given by the above preamble, is essentially characterised in that the connecting piece has a circular shape and comprises two diametrically opposed portions attached by snapping respectively on the top ends of the two half shells.

Moreover, embodiments of the invention may comprise one or more of the following features:

- the connecting piece comprises two bosses received in housings formed respectively on the two half shells,
- 5 – the cap includes at least one and preferably two snap-on systems between the connecting piece and each half shell,
- the top ends of the two half shells connected to the connecting piece are curved and grip said connecting piece,
- the connecting piece is in the general shape of an annulus the central part of which
- 10 forms an access opening to the protective interior volume,
- the cap comprises securing-spindle systems cooperating with housings formed in the half shells at the top level and at the bottom level of the cap, i.e. the two half shells are secured to each other by securing-spindle systems located at the top part and at the bottom part of the half shells,
- 15 – the two half shells are identical and the connecting piece has a symmetrical form on a plane perpendicular to the base,
- the bottom ends of the two half shells are curved and grip a ring or a thread located on the neck of a reservoir.

The invention also relates to a pressurised-fluid reservoir, in particular a bottle, comprising

20 a tap and a protective cap for the tap, the cap being in accordance with any one of the above or following features.

The invention also relates to a method for mounting a protective cap according to any one of the above or following features on a pressurised-fluid reservoir, comprising:

- a step of connecting a first half shell to the connecting piece by snapping on,
- 25 – a step of mounting the bottom end of the cap around a reservoir neck,
- a step of connecting the second half shell to the connecting piece by snapping on,
- a step of securing the two half shells to each other via securing-spindle systems cooperating with housings formed in the half shells, the securing step providing a clamping of the two half shells together and around the bottom end of the cap.

30 According to other possible features:

- the step of connecting the second half shell to the connecting piece by snapping on is implemented after or before the step of mounting the bottom end of the cap around a reservoir neck,

– the step of mounting the bottom end of the cap around the neck of a reservoir is preceded by at least one from: a step of mounting a tap in an orifice of the neck of the reservoir, a step of mounting an attachment ring around the neck of the reservoir.

The invention can also relate to any alternative device or method comprising any combination of the features above or below within the scope of the claims.

Other particularities and advantages will emerge from the reading of the following description, made with reference to the accompanying figures, in which:

- figure 1 shows a perspective view, schematic and partial, illustrating an exploded configuration of an example of a pressurised-fluid reservoir cap,
- figure 2 shows a perspective view, schematic and partial, illustrating a part of the cap of figure 1 in an exploded position,
- figure 3 shows a perspective view, schematic and partial, illustrating a part of the cap of figure 2 in an assembled position,
- figure 4 shows an enlarged view of a detail of figure 3,
- figures 5 and 6 show perspective views, schematic and partial, illustrating two possible steps of assembling and mounting the cap on a reservoir.

The cap illustrated in figure 1 comprises two half shells 2, 3 that are connected to each other on a vertical plane (when the cap is in a vertical position).

The two half shells 2, 3 define a bottom base 4 intended to be mounted at an orifice of a reservoir, in particular around a neck of a reservoir 11 (a bottle for example). For example, the two half shells each include at their bottom end a shape that is attached around a securing ring 10 and/or an impression formed on the neck of the bottle 11.

Thus the bottom ends of the two half shells 2, 3 can be curved to grip a ring 10 or a thread located on the neck of a reservoir 11.

The two half shells 2, 3 are thus assembled on a plane perpendicular to the base 4 and define an interior protective volume for a tap.

The two half shells 2, 3 are rigidly assembled by securing-spindle systems 5 cooperating with housings 6 formed in the half shells 2, 3 (for example the spindles 5 can comprise screws, studs or the like cooperating with stops and/or threads and/or nuts and/or washers in the orifices 6).

In the non-limitative example, two spindles 5 secure the two half shells at the top part (in particular transversely to the joint plane of the two half shells at 2, 3). Likewise, two spindles 5 secure the two half shells at the bottom part (in particular transversely to the joint plane of the two half shells at 2, 3).

The two half shells 2, 3 define, in the assembled position, at least one opening 7, 8 for access to the interior protective volume (for example a top opening 7 and at least one lateral opening 8).

5 The cap furthermore comprising, at a top end of the cap, a connecting piece 9 comprising two ends attached respectively to the two half shells 2, 3 by snapping on. Snapping on means in particular elastic deformation of at least one piece with respect to the other. The snapping on may be definitive (not demountable without breaking one of the pieces) or non-definitive (i.e. demountable and which can be remounted where applicable).

10 According to one advantageous particularity, the connecting piece 9 has a circular shape and in particular forms an annulus and comprises two diametrically opposed portions attached by snapping respectively on the top ends of the two half shells 2, 3.

For example, at least one and preferably two snap-on systems 13 between the connecting piece 9 and each half shell 2, 3.

15 Each snap-on system can include a claw or elastic piece on the connecting piece 9 cooperating with a housing or a stop on the adjacent piece.

As illustrated, the connecting piece 9 can comprise two bosses 19 or protrusions received in conjugate housings 29 formed respectively on the two half shells 2, 3. This provides positioning of the pieces and a force take-up for the cap.

20 In addition, at least a part of the half shells 2, 3 may, in cross-section, have a non-planar shape enveloping the periphery of the connecting piece 5 that it accommodates.

As illustrated in figure 2, a part of the snap-on system (hook or other) may be located at each end of the boss 19 (on the circumference of the piece 1).

As shown, the top ends of the two half shells 2, 3 connected to the connecting piece 9 are preferably curved and grip said connecting piece 9 in the assembled position.

25 In the case where the connecting piece 9 is in the general form of an interior protective annulus for the cap 1.

The connecting piece 9 can advantageously incorporate an electronic communication member, for example an antenna or a communication device of the NFC or RFID type for example.

30 This simple structure makes it possible to provide preassembly of the two half shells 2, 3 as detailed below. In addition this structure provides effective and strong cohesion of the cap and in particular good distribution and absorption of the forces in the case of impact.

In addition, as illustrated in the figures, this architecture makes it possible to use two identical half shells 2, 3 and a connecting piece 9 having a symmetrical shape on a midplane

perpendicular to the base. This makes it possible to optimise manufacturing costs (plastic moulding or metal casting for example).

Different manufacturing materials can be provided for the shells and the connecting piece: example metal shells to confer greater mechanical strength on the cap, and a connecting
5 piece made from plastics material. In this configuration, electronic communication devices, passive or not, can be located in the plastic piece for optimum operation (no disturbance of the metal pieces).

The cap can be assembled or mounted for example as follows.

In a first step an operator (or a machine) can secure a first half shell 3 to the connecting
10 piece 5 by snapping on (cf. figures. 2, 3 and 4).

The half shell 3 secured to the connecting piece 9 can be mounted around the neck of the tap (figure 5).

At this stage the reservoir 11 may already be provided with a tap 12 (for example screwed in a threaded orifice). In addition, the neck of the reservoir 11 is provided with an attachment
15 portion for the cap 1, in particular an attached ring 10 that may be split (or any other attachment system, such as a thread, can be envisaged).

The second half shell 2 can in its turn be snapped on the other end of the connecting piece 9 while being mounted around the neck of the reservoir 11.

Thus an operator can easily provide pre-mounting of the cap 1 with two hands. The screwing
20 of the spindles 5 can next be done easily.

This structure makes mounting very ergonomic.

Naturally, this example of mounting is in no way limitative.

Thus, for example, the two half shells 2, 3 can be pre-assembled on the connecting piece 9. The assembly can next be mounted on the reservoir 1. For example, the separation of
25 the two half shells can allow mounting on the neck (for example via a slight relative movement).

Although the structure is simple and inexpensive, the invention confers great reliability and strength on the cap obtained.

Patentkrav

- 1.** Beskyttelseshætte til en ventil til en trykfluidbeholder omfattende to med hinanden samlede halvskåle (2, 3), hvor de to halvskåle (2, 3) definerer en nedre basis (4), der er beregnet til at monteres ved en munding i en beholder, især omkring en beholderhals, idet de to halvskåle (2, 3) er samlede langs et plan vinkelret på basis (4) og definerer et indre beskyttelsesrumfang for en ventil, idet de to halvskåle (2, 3) er samlede med fastgørelsesboltsystemer (5), der samvirker med i halvskålene (2, 3) dannede fordybninger (6), idet de to halvskåle (2, 3) i den samlede stilling definerer mindst en åbning (7, 8) til adgang til det indre beskyttelsesrumfang, idet hættens desuden ved en øverste ende af hættens omfatter et forbindelsesstykke (9), der omfatter to ender, der hver især er ophængt på de to halvskåle (2, 3) ved en palmekanisme, **kendetegnet ved, at** forbindelsesstykket (9), er cirkulært og omfatter to diametralt modsatte dele, der hver især ved en palmekanisme er ophængt på de to halvskåles (2, 3) øvre ender, og **at** de to halvskåles (2, 3) øvre ender, der er forbundet med forbindelsesstykket (9), er krummede og indspænder forbindelsesstykket (9).
- 2.** Hætte ifølge krav 1, **kendetegnet ved, at** forbindelsesstykket (9) omfatter to forhøjninger (19), der optages i fordybninger (29) dannet på hver af de to halvskåle (2, 3).
- 3.** Hætte ifølge krav 1 eller 2, **kendetegnet ved, at** den har mindst et og fortrinsvis to palsystemer mellem forbindelsesstykket (9) og hver halvskål (2, 3).
- 4.** Hætte ifølge et hvilket som helst af kravene 1 til 3, **kendetegnet ved, at** forbindelsesstykket (9) generelt har form af en ring, hvis centrale del danner adgangsåbningen (7) til det indre beskyttelsesrumfang.
- 5.** Hætte ifølge et hvilket som helst af kravene 1 til 4, **kendetegnet ved, at** den omfatter fastgørelsesboltsystemer (5), der samvirker med i halvskålene (2, 3) dannede fordybninger (6) ved hættens top og bund, det vil sige at de to halvskåle (2, 3) er fast forbundet med hinanden ved fastgørelsesboltsystemer (5), der befinder sig i den øvre del og i den nedre del af halvskålene (2, 3).

6. Hætte ifølge et hvilket som helst af kravene 1 til 5, **kendetegnet ved, at** de to halvskåle (2, 3) er identiske, og forbindelsesstykket (9) er symmetrisk om et plan vinkelret på basis.

5 7. Hætte ifølge et hvilket som helst af kravene 1 til 6, **kendetegnet ved, at** de to halvskåles (2, 3) nedre ender er krummede og i den samlede stilling indspænder en krans (10) eller et gevind, der befinder sig på halsen af en beholder (11).

8. Trykfluidbeholder, især flaske, omfattende en ventil (12) og en
10 beskyttelseshætte (1) til ventilen, **kendetegnet ved, at** hætten er i overensstemmelse med et hvilket som helst af kravene 1 til 7.

9. Hætte ifølge et hvilket som helst af kravene 1 til 7, **kendetegnet ved, at** de to halvskåle består af et metallisk materiale, og **at** forbindelsesstykket består af
15 plastic.

10. Hætte ifølge et hvilket som helst af kravene 1 til 7 eller 9, **kendetegnet ved, at** forbindelsesstykket har et integreret elektrisk kommunikationselement, såsom en antenne.

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11. Fremgangsmåde til montering af en beskyttelseshætte på en trykfluidbeholder (11), hvor hætten omfatter to med hinanden samlede halvskåle (2, 3), idet de to halvskåle (2, 3) definerer en nedre basis (4), der er beregnet til at monteres ved en munding i en beholder, især omkring en beholderhals, idet de to halvskåle (2, 3) er samlede langs et plan vinkelret på basis (4) og definerer et indre beskyttelsesrumfang til en ventil, idet de to halvskåle (2, 3) er samlede med fastgørelsesboltsystemer (5), der samvirker med i halvskålene (2, 3) dannede fordybninger (6), idet de to halvskåle (2, 3) i den samlede stilling definerer mindst en adgangsåbning (7, 8) til det indre beskyttelsesrumfang, idet hætten desuden
25 ved en øverste ende af hætten omfatter et forbindelsesstykke (9), der omfatter to ender, der hver især er ophængt på de to halvskåle (2, 3) ved en palmekanisme, **kendetegnet ved, at** forbindelsesstykket (9), er cirkulært og omfatter to diametralt modsatte dele ophængt ved en palmekanisme i hver af de to halvskåles (2, 3) øvre ender, hvilken fremgangsmåde omfatter:

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- et trin til fast forbindelse ved en palmekanisme af en første halvskål (2, 3) med forbindelsesstykket (9),
- et trin til montering af hættens nedre ende omkring en beholderhals,
- et trin til fast forbindelse ved en palmekanisme af den anden halvskål (3) med forbindelsesstykket (9),
- et trin til fastgørelse af de to halvskåle med hinanden over fastgørelsesboltsystemer (5), der samvirker med i halvskålene (2, 3) dannede fordybninger (6), idet fastgørelsestrinnet sikrer en indspænding af de to halvskåle med hinanden og omkring hættens nedre ende.

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12. Fremgangsmåde ifølge krav 11, **kendetegnet ved, at** trinnet til fast forbindelse ved en palmekanisme af den anden halvskål (3) med forbindelsesstykket (9) udføres efter eller før trinnet til montering af hættens nedre ende omkring en beholderhals.

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13. Fremgangsmåde ifølge et hvilket som helst af kravene 11 eller 12, **kendetegnet ved, at** der forud for trinnet til montering hættens nedre ende omkring en beholders (11) hals udføres mindst et blandt: et trin til montering af en ventil (12) i en munding i beholderens (11) hals, et trin til montering af en fastgørelseskrans (10) omkring beholderens (11) hals.

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14. Fremgangsmåde ifølge et hvilket som helst af kravene 11 til 13, **kendetegnet ved, at** de to halvskåles (2, 3) øvre ender, der er forbundet med forbindelsesstykket (9), er krummede og indspænder forbindelsesstykket (9).

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