A device (8) for dispensing a fluid comprises: a vessel (1); a cartridge (20) with pressurized gas which has a seal (22) which can be broken by first operating means (9,12), seal breaking means (21); pressure reducing means (23); a dip tube (24) which extends to the inlet of a non-return valve (25); a dispensing conduit (9); second operating means (6) which can be operated in the operative position in order to open the non-return valve wherein by means of a transmission (29) the first operating means activate the breaking means simultaneously with the rotation of the dispensing conduit from the rest position to the operative position.
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DEVICE FOR DISPENSING A FLUID

The invention relates to a device for dispensing a fluid.

In recent years the use of a beer tap device for home use has become increasingly popular. Use is for instance made of a closed container, in particular a keg, in which the beer is located. A carbon dioxide cartridge connects to the container for the purpose of charging the beer with carbon dioxide under pressure. An (additional) absorption of carbon dioxide in the beer effectively takes place hereby, and the pressurized gas can also serve as propellant for propelling the beer to a tap via provisions intended for this purpose.

It is an object of the invention to embody a device for dispensing a fluid, for instance, though not exclusively, beer, such that the device has a superior convenience of use but nevertheless has a simple construction.

With a view hereto the invention provides a device for dispensing a fluid, which device comprises:

- a sealed vessel in which the fluid is received;
- a carrier for a cartridge with pressurized gas, which cartridge has a seal which can be broken by means of first operating means which can be operated manually from the outside, and the carrier comprises breaking means for breaking the seal such that gas is generated by the cartridge;
- pressure reducing means which are coupled to the carrier and connect to the breaking means for receiving pressurized gas, and which generate received gas under reduced pressure to the space inside the vessel for charging the fluid present therein with gas under a certain overpressure;
- a dip tube which extends in the vessel from the bottom zone thereof to the inlet of a non-return valve which is normally closed under the influence of return spring means and the outlet of which debouches on the top side of the vessel;
a dispensing conduit which is present on the top side of the vessel and the inlet of which is connected sealingly to the outlet of the non-return valve at least in the operative position, and the outlet of which in that case protrudes outside the vessel for the purpose of dispensing fluid;

second operating means, which can be operated manually from the outside in the operative position, for displacing the valve body of the non-return valve counter to the action of the return spring means, whereby the non-return valve is opened, this such that, due to the overpressure of the gas in the vessel, fluid is pressed via the dip tube, the opened non-return valve and the dispensing conduit to the outlet of the dispensing conduit, and is there dispensed,

wherein the breaking means comprise a hollow pin for perforating the seal during a relative axial displacement of the cartridge relative to the breaking means as a result of operating the first operating means; and

wherein a transmission converts a displacement of the first operating means from the rest position to the operative position into said axial displacement of the cartridge relative to the hollow pin.

It is noted that the device is not limited to the use of specific fluids. Optionally carbonated drinks are primarily envisaged, but dosed dispensing of other fluids also fits within the scope of the invention. It is even possible to envisage fluids with an increased viscosity, even masses which are to greater or lesser extent pasty, such as mayonnaise, mustard, tomato ketchup and the like.

Carbon dioxide is in many cases a suitable first option as propellant. In the case where carbon dioxide were to have undesirable effects, for instance causing a slightly acidic taste in a drink, the use of nitrogen gas instead of carbon dioxide could be considered. In the dispensing of for instance essentially non-acidic drinks such as chocolate milk, coffee and the like, nitrogen gas is a better choice in respect of its wholly taste-neutral character.
The cartridge for pressurized gas can for instance be inserted into the container from above with the delivery opening downward. The breaking means are then situated on the underside and directed toward the perforated pin arranged on the underside of the carrier.

In another embodiment the cartridge for pressurized gas can also be accommodated by the carrier such that the delivery opening for pressurized gas is situated on the top side.

The operating means can have a desired degree of freedom, or also multiple degrees of freedom.

In a determined embodiment the device according to the invention has the special feature that the second operating means comprise a manually movable arm. This arm can for instance be adapted to pivot through a certain angle, for instance be able to swing through a full 180°, and be adapted to slide in a determined plane, for instance a horizontal or vertical plane, or have a combination of a number of degrees of freedom of translation and/or rotation.

The arm can for instance be pivotable in any ergonomically applicable direction and plane.

According to an aspect of the invention, the device has the special feature that the vessel is a keg, comprising a base with a body sealingly connected thereto, to the mouth rim of which body an upper wall is sealingly connected, for instance by means of a seam-folded connection. The advantage of this embodiment is that a keg is mechanically strong and inexpensive, and will in most cases withstand a fall without losing its integrity.

According to an aspect of the invention, the device has the special feature that the upper wall has a filling opening which is closed after the vessel has been filled with fluid.

According to a specific, important aspect of the invention, the device has the special feature that the filling opening is positioned centrally. This aspect is of technical importance for the filling line where a vessel is filled with fluid. With this latter aspect the position of the filling opening at the location of the
filling station does not depend on the horizontal angular position of the vessel.

According to an important aspect of the invention, the device has the special feature that the upper wall of the vessel has two openings, wherein at least one of the carrier, the breaking means, the pressure reducing means, the dip tube, the non-return valve and the dispensing conduit is inserted sealingly into the one opening and the other(s) is or are inserted sealingly into the other opening. Other than in the known art, wherein the filling opening is closed with a plug after filling, the filling opening is used in this embodiment for the purpose of the structure according to the invention.

This latter embodiment in particular can have the feature that the carrier, the breaking means and the pressure reducing means are inserted into a central opening and the dip tube, the non-return valve and the dispensing conduit are inserted into the other opening, and the dispensing conduit is connected to the outlet of the non-return valve via a substantially fluid-tight swivel coupling.

According to a further aspect of the invention, the device has the special feature that at least the carrier, the breaking means, the pressure reducing means, the dip tube, the non-return valve and the dispensing conduit are assembled into a first unit, and the upper wall of the vessel has at least one opening into which this unit is sealingly inserted, optionally in removable manner. This unit can be pre-assembled and be sealingly inserted into the opening in one simple operation. This latter operation can take place before or after filling of the vessel. It will be apparent that the unit must be inserted into the hole such that there is no risk of it being driven outward under the influence of the gas pressure in the vessel, or at least of losing its sealing character.

A very practical embodiment is that in which the arm comprises the dispensing conduit.

It is noted that the arm can be used to exert the force necessary to activate the breaking means in
combination with pivoting of the arm, which is also the dispensing conduit, from the rest position to the operative position. It will be apparent that it is likewise possible to activate the breaking means by rotating a relevant control knob, the rotating movement of which is also transferred by the transmission to the arm, which hereby pivots from its rest position to its operative position.

Use is preferably made of a structure in which the arm is pivotable at least more or less parallel to the upper wall of the vessel.

This latter embodiment can advantageously comprise a transmission, which transmits a pivoting movement from the rest position to the operative position of the arm to the first operating means, whereby the breaking means are activated, wherein a push cap is arranged rotatably above the carrier and the breaking means, which push cap is coupled to the arm in a manner locked against rotation and is connected to the carrier and/or the breaking means by means of a screw transmission such that, by pivoting of the arm and corresponding rotation of the push cap, this push cap also undergoes a downward directed displacement and thus presses the cartridge and the hollow pin toward each other such that the hollow pin perforates the seal.

An embodiment which is practical, simple, effective and inexpensive to realize has the special feature that the transmission comprises two co-acting toothed wheels and/or gear rings.

With a view to storage and transport, the device can have the special feature according to an important aspect of the invention that the projection of the arm in the rest position lies within the periphery of the upper wall of the vessel.

An embodiment in which the arm is connected pivotally to the carrier can be realized in technically simple manner.

In a preferred embodiment this latter variant has the special feature that the pivot axis substantially coincides with the axis of the carrier.
In a practical embodiment the device has the feature that a push cap is arranged rotatably above the carrier and the breaking means, which push cap is coupled to the arm in a manner locked against rotation and is connected to the carrier and/or the breaking means by means of a screw-transmission such that, by pivoting of the arm and corresponding rotation of the push cap, this push cap also undergoes a downward directed displacement and thus presses the cartridge and the hollow pin toward each other such that the hollow pin perforates the seal.

It must be generally understood that the arm serves to bring about a relative axial displacement of the cartridge for pressurized gas relative to the hollow pin. As soon as this arm arrives in its operative position it acquires the function of dispensing conduit and the end thereof protrudes outside the vessel such that a user can hold a receptacle such as a glass, cup or beaker under the dispensing opening. Tapping of the fluid can then take place by operating the second operating means, which are intended solely for displacing the valve body of the non-return valve counter to the action of the return spring means such that the valve body moves clear of the valve seat and the valve is opened.

It would be possible to suffice with a push button with which the valve body is displaced. An embodiment is however recommended in which the second operating means comprise a tap handle.

According to yet another aspect of the invention, the device has the special feature that an attachment is coupled in optionally releasable manner to the upper peripheral edge of the vessel, in which attachment the components protruding above the upper peripheral edge of the vessel are received in substantially recessed manner in the rest position such that the device is stackable with like devices.

A specific embodiment has the feature that the attachment bears the first and the second operating means.
In a preferred embodiment the latter variant has the special feature that the attachment is coupled in at least tensively strong manner to the vessel. The tensile strength is particularly important at the position of the cover of the vessel. The attachment can for instance be coupled to the peripheral seam-folded edge of the vessel by means of a snap connection, whereby the cover is fastened sealingly to the vessel. At the position of the carrier and the first operating means there is preferably also a tensively strong connection, for instance also a snap connection, wherein snap lips engage under the peripheral seam-folded edge of the relevant opening, for instance a central opening.

This latter embodiment can advantageously have the feature that the attachment has a through-hole serving as carrying handle.

According to a subsequent aspect of the invention, the device has the feature that the tap handle is supported pivotally in a vertical plane by the attachment and is adapted to exert a pressure force directed counter to the action of the return spring means on the valve body of the non-return valve in order to open the non-return valve.

As described above, the dispensing conduit, also arm, must be displaced prior to use of the device from its storage and transport rest position to its operative position. In this operative position the inlet of the dispensing conduit connects sealingly to the outlet of the non-return valve. In this respect the device can have the special feature that the outlet of the non-return valve has a certain flexibility such that the dispensing conduit can be moved relative thereto from the rest position to the operative position, and the mutual sealing of the outlet of the non-return valve and the inlet of the dispensing valve is ensured in the operative position.

The flexibility sought after can be realized by embodying the outlet of the non-return valve in a soft, for instance rubber-like material. As alternative, or in combination therewith, use can also be made of an outlet pipe of the non-return valve with a small wall.
thickness. The wall thickness can also decrease toward the outside.

Other possibilities can also be envisaged for ensuring the required seal between the outlet of the non-return valve and the inlet of the dispensing conduit. According to yet another aspect of the invention, the device can thus have the special feature that the outlet of the non-return valve and the inlet of the dispensing conduit are chamfered in corresponding manner.

According to a further aspect, the device according to the invention can advantageously be provided with guarantee seal means, which can be broken only in outwardly recognisable manner and only in broken state enable displacement of the first operating means from the rest position and/or breaking of the seal of the cartridge with pressurized gas.

A preferred embodiment of the device according to the invention has the special feature that the attachment has a slotted hole which serves to allow passage of the arm during its pivoting movement from the rest position to the operative position.

This latter embodiment can advantageously have the special feature that the guarantee seal means are added to the slotted hole in a manner such that the arm can be displaced from its rest position to its operative position only after the guarantee seal means have been broken. In this manner the guarantee seal means are embodied as "tamper-evident feature".

In a further development hereof the device has the special feature that in the rest position the arm can be in contact with the atmosphere only via the slotted hole and in the rest position the guarantee seal means wholly cover the slotted hole. In this embodiment the arm is moreover protected against contamination during production, transport and storage, particularly in the case where it also comprises the dispensing conduit.

According to yet a further aspect of the invention, the device can advantageously have the special feature that covering means are added to the first operating
means, which covering means cover the outlet of the non-
return valve in the rest position.

Accommodating both the connection for a dip tube
and a cartridge for pressurized gas in one unit provides
advantages in the filling and subsequent closing of the
vessel on the filling line. Such a unit, wherein the dip
tube and the gas cartridge protrude at least partly into
the vessel, is for instance known from EP-A-O 149 352.

In the drink container as known from US-A-5 110 012
both the dip tube and the cartridge for pressurized gas
protrude fully into the drink container and are
integrated into one unit with the closing cap for the
drink container.

When the cartridge with pressurized gas is not
activated during filling of the container and in the
logistic chain to the end user, no undesirable supply of
gas to the drink container can occur, nor can a pressure
build-up occur in this container as a result.

EP-A-I 642 862 shows and describes a drink
container with a cartridge with carbon dioxide under
pressure, wherein perforating of the cartridge is
activated by means of operating means which can be
controlled from the outside, so outside the drink
container. After first use the setting of the gas
cartridge is automatically blocked.

The invention will now be elucidated with reference
to the accompanying drawings of two exemplary
embodiments. For the sake of clarity and a good
understanding of the similarities and differences
between the two exemplary embodiments to be described
hereinbelow, functionally corresponding components, the
embodiments of which may however differ from each other,
will be respectively designated, where possible and
useful, with reference numerals for the first exemplary
embodiment and, for the second exemplary embodiment, the
same reference numerals to which an accent is added.
Figures 1-8 relate to the first exemplary embodiment,
figures 9-17 relate to the second exemplary embodiment.
Elements and components which are corresponding and of
substantially the same embodiment are designated at all
times with the same reference numerals where this is possible and useful.

In the drawings:

figure 1 shows a perspective view of a first exemplary embodiment of the device according to the invention in the rest position for storage and transport;

figure 2 shows a view corresponding with figure 1 of the device in ready-to-use situation;

figure 3 shows a view of the situation corresponding with figures 1 and 2, in which a user is about to tap fluid from the vessel;

figure 4 is a top view of a device in the situation according to figure 1, with omission of the attachment;

figure 5 is a top view of the device in the situation according to figures 2 and 3, with omission of the attachment;

figure 6 shows a partial cross-section through the device in the situation according to figure 1;

figure 7 shows a cross-section corresponding with figure 6 in the situation according to figure 2;

figure 8 shows a cross-section corresponding with figures 6 and 7 in the situation according to figure 3, in which the non-return valve is opened and fluid is dispensed;

figure 9 shows a view corresponding with figure 1 of a second exemplary embodiment;

figure 10 shows a view corresponding with figure 2 of the second exemplary embodiment;

figure 11 shows a view corresponding with figure 3 of the second exemplary embodiment;

figure 12 is a perspective view of a vessel according to the second exemplary embodiment, in which the attachment with manually controllable operating means is not drawn;

figure 13 is a perspective view of the vessel according to figure 12 and the as yet unassembled attachment;

figure 14 is a perspective view of the vessel according to figure 12, on which several operating means
are shown, wherein the actual attachment is not drawn for the sake of clarity;

figure 15 shows a cross-section corresponding with figure 6 through a device according to the invention in the second embodiment;

figure 16 shows a cross-section corresponding with figure 7 through the second exemplary embodiment; and

figure 17 shows a cross-section corresponding with figure 8 through the second exemplary embodiment.

For the sake of clarity in the drawings, hatching is largely omitted in cross-sections.

Figures 1-8 show a vessel 1 embodied as a keg, for instance with a volume of several litres, for home use. The vessel is filled with a fluid, for instance beer.

In a manner to be described hereinbelow the vessel 1 is closed sealingly by an upper wall 2, which is connected to the mouth rim of the body of the vessel by means of a seam-folded edge 3, see figures 6, 7 and 8. An attachment 4 of a stiff plastic is arranged on the closed and filled vessel. Attachment 4 is firmly coupled to seam-folded edge 3 by means of a snap connection (not drawn). The attachment has such a form with through-openings such that a part 5 can serve as carrying handle for the filled container with accessories.

Attachment 4 carries a tap handle 6 which is pivotable in a vertical plane and has a control protrusion 7 which can be in pressing co-action with the valve body of a non-return valve to be described hereinbelow for the purpose of tapping fluid from the vessel.

In figure 1 the device 8 according to the invention, i.e. vessel 1 with attachment 4 and all further accessories, is situated in its rest position for storage and transport.

As also shown in figures 6, 7 and 8, an arm 9 is connected pivotally to upper wall 2. Figure 2 shows with an arrow 10 the pivoting displacement of arm 9 from the rest position shown in figure 1 to the operative position shown in figure 2.

In the rest position according to figure 1 the projection of arm 9 lies within the periphery of the
vessel. The manageability of device 8 in this position for the purpose of storage and transport is hereby not adversely affected.

In the situation shown in figure 2 the user has pivoted arm 9 to the right in the figures as according to arrow 10, and device 8 is ready for tapping of fluid. For this purpose the user displaces the tap handle, initially recessed into attachment 4, from its position shown in figures 1 and 2 to the tapping position shown in figure 3. This displacement is designated with an arrow 11.

As shown in figures 2 and 3, arm 9 also fulfills the function of dispensing conduit. The manner in which this function is realized will be elucidated with reference to figures 6, 7 and 8.

It is important that the arm is carried by a cap 12 which also carries a cover element 13 which, in the rest position according to figure 1, covers the outlet of the non-return valve to be described hereinbelow and thus protects it against contamination and damage.

Figures 4 and 5 show that upper wall 2 has a central filling opening 14, which is closed in sealing and pressure-resistant manner by means of a plug 15 after the vessel has been filled with fluid. Reference is also made herefor to figures 6, 7 and 8.

In figure 6 the axis of vessel 1, of filling opening 14 and of plug 15 is designated by means of a dash-dot line 16.

Dash-dot line 39 is both the pivot axis of arm 9 and the axis of carrier 19.

Upper wall 2 has a second opening 17, the contours of which are also drawn in figures 4 and 5.

An integral unit 18 is inserted in this second opening in pressure-resistant, sealing manner, this unit comprising: a sleeve-like carrier 19 for a carbon dioxide cartridge 20, a hollow pin 21 with chamfered front edge for perforating the seal 22 of a cartridge 20, a pressure reducing unit 23 of per se known type connecting to pin 21, a dip tube 24 and a non-return valve 25.
In the situation shown in figure 6 cartridge 20 is carried in rest position and seal 22 is still intact. Cartridge 20 can be pressed axially downward from the top by means of means shown hereinbelow. This downward-directed axial displacement is indicated in figure 7 with an arrow 26.

Use is made of pressing means, comprising a second cap 27 which is moved downward by means of a screw-like transmission when performing the pivoting movement from the rest position according to figure 1 to the operative position according to figure 2. For this purpose cap 27 can be driven pivotally by arm 9 while being locked against rotation by rotation locking means 28. As a result of the presence of the screw-like transmission 29 cartridge 20 is moved downward as according to arrow 26 by this pivoting movement. As according to figure 7 the seal 22 is hereby perforated and carbon dioxide is carried under high pressure, for instance 80 bar, through hollow pin 21 to pressure reducing unit 23 where the pressure is effectively reduced to a practical operating pressure in the order of 0.8 - 1.0 bar. Carbon dioxide under this reduced pressure is supplied to the vessel through openings 30. After puncturing of the carbon dioxide cartridge 20 the fluid in the vessel is thus charged by carbon dioxide under a pressure of 0.8 - 1.0 bar.

Non-return valve 25, which comprises a valve body 31 and a valve seat 32, is initially still in its closed position as according to figures 6 and 7. The valve body is loaded by a return spring 34 which presses valve body 31 sealingly against valve seat 32. Dip tube 24, which is intended for carrying fluid upward from the bottom zone of the vessel under the influence of the pressure of the propellant, the carbon dioxide under pressure, connects to inlet 33 of return valve 25. For this purpose valve body 31 is pressed downward during tapping. According to figure 8, cap 12 is for this purpose pressed downward as according to an arrow 35 counter to the action of a second return spring 135. As figure 8 shows, valve body 31 is hereby pressed downward counter to the action of return spring 34. Non-return
valve 25 is thus opened and liquid can pass through the non-return valve via dip tube 24. Meanwhile, i.e. at the transition between figures 6 and 7 (and figures 1 and 2), the inlet 36 of the arm-cum-dispensing conduit 9 has been positioned sealingly above outlet 37 of non-return valve 25 such that fluid can be dispensed through the dispensing conduit via dispensing opening 38. The fluid flow is designated schematically with arrows 139.

Not shown is that, in the situation shown in figure 1, arm 9 is guarantee sealed relative to attachment 4. Use can be made for this purpose of for instance a known, relatively weak guarantee seal which is firmly adhered to both relevant surfaces. As soon as arm 9 is displaced by a user or a malicious person in the direction of arrow 10 as according to figure 2, the connection is irreversibly and irreparably damaged, this being immediately visible to a bona fide buyer.

For assembly purposes the cap 12 can for instance be coupled to a second cap 27 with a bayonet-like structure.

For the purpose of a good sealing, valve body 31 can for instance be manufactured from a soft plastic such as LLDPE. As alternative thereto or in combination therewith, the valve seat can also be manufactured from such a plastic.

Dip tube 24 can be embodied as a hose of a suitable material, for instance PE.

As described in the foregoing, the device according to the invention has three positions. Figure 1 shows the rest position, in which the pressure gas cartridge is still wholly intact and the dispensing conduit is not yet in a position in which fluid can be dispensed from the vessel. This is the position in which the filled vessel is supplied by the factory for further distribution and sale.

Figure 2 shows the ready-to-use or standby position, in which the carbon dioxide cartridge is active and the user is able to tap fluid from the fluid charged by pressurized gas.

Figure 3 shows the dispensing position, in which the user actually taps fluid from the vessel.
The first position can be designated as the rest position and the second and third position can together be deemed the operative position, which is then in turn divided into two phases.

Figure 6 shows the rest position, figure 7 the standby position, figure 8 the tapping position, figure 9 the rest position, figure 10 the standby position, figure 11 the tapping position, figure 14 the rest position, figure 15 the rest position, figure 16 the standby position and figure 17 the tapping position.

In terms of basic functionality the second embodiment according to figures 9-17 corresponds to the first exemplary embodiment according to figures 1-8, but differs therefrom in a number of respects.

Tap handle 6' is supported pivotally by a rotatable head 43, which is provided with external screw thread 44 which co-acts with internal screw thread 45 in a bush 46 forming part of attachment 4'. By rotating the head 43 from the rest position to the standby position the rotating movement of head 43 is converted into an axial displacement of the head by the co-acting screw threads 44 and 45, which head is coupled to the breaking means and, owing to this axial displacement, displaces hollow pin 21 downward from the rest position shown in figure 15 to the respective standby and tapping positions shown in figure 16 and figure 17.

It is always apparent from figures 15, 16 and 17 that, in contrast to the first exemplary embodiment, the delivery opening of carbon dioxide gas cartridge 20 is directed upward instead of downward. Via pressure reducing unit 23, which can be of any known and suitable type, the carbon dioxide is admitted into the space in the vessel 1' above the fluid for dispensing.

At the transition from the standby position to the tapping position the non-return valve 25, which in this embodiment is of the aerosol valve type, is opened and fluid is pushed upward via dip tube 24 under the influence of the gas pressure in vessel 1', after which it passes through the opened non-return valve 25 and leaves device 8' via dispensing conduit 9.
Plastic carrier 19' is inserted into central filling opening 14, the edge of which is finished in the form of a seam-folded edge 56. Carrier 19' is provided on its upper side with a protruding peripheral flange 57 with a number of snap lips 58 which engage under seam-folded edge 56.

Figure 14 shows that a rotation of head 43 together with tap handle 6' performed with some force as according to arrow 10' also serves to pivot the arm, also dispensing conduit 9, from the rest position to the standby position in a horizontal plane as according to arrow 10. For this purpose the head 43 has a toothing 47 which co-acts with a part 48 of a toothed wheel. It is noted that in principle it makes no difference from a mechanical viewpoint whether a user rotates head 43 with force or pivots arm 9 with force. In respect of the mechanical dimensioning of the relevant components it will however be immediately apparent that arm 9, which is rotatable with little force, is less suitable for exerting the relatively great rotation force necessary to activate the breaking means. This has already been taken into account in the design of device 8'. It will be apparent from for instance figure 9 that the upper side of device 8 as it were automatically invites the user to grasp head 43 and/or the tap handle 6' coupled thereto in order to rotate it in the direction of the standby position shown in figure 10.

The inlet of dispensing conduit 9 is coupled rotatably and in substantially fluid-sealing manner to outlet 49 of non-return valve 25. As shown particularly clearly in figures 15, 16 and 17, the pivot axis of the pivoting movement of arm/dispensing conduit 9 coincides with the central axis of non-return valve 25.

Tap handle 6' is pivotally connected to head 43 by means of a pivot pin 50, which is shown clearly in figures 16 and 17.

A co-axial bush 52 on the vertical part of dispensing conduit 9 is coupled to attachment 4' using a snapping connection 51. This corresponds with the standby position drawn in figure 16.
Figure 17 shows that snapping connection 51 is displaced downward with some force along the interior of bush 52 during the transition from the standby position to the tapping position.

Attachment 4' engages with a ring of snap lips 53 under the peripheral seam-folded edge 3, which forms the coupling between the body of vessel I₁ and the upper wall or cover 2.

It will be apparent from the above that the peripheral edge of attachment 4' is connected in tensively strong manner to the body of vessel I₁. Carrier 19' is likewise connected in tensively strong manner to cover 2, i.e. by the above described snap coupling between upper peripheral flange 57 of carrier 19' and seam-folded edge 56, which forms the periphery of filling opening 14.

Non-return valve 25 is carried by a dish 54, which by means of a sealing ring co-acts sealingly with a seam-folded edge 56, which forms the boundary of second opening 17.

The internal screw thread 45 can be of the discontinuous, interrupted type. With such a screw thread it is possible to achieve that the screw thread 44 to be brought into co-action can snap thereover in order to bring about the connection between head 43 and attachment 4'.

The device according to the invention can be provided with a guarantee seal.

For displacement of dispensing conduit 9 from its rest position as shown in figure 9 to the standby position shown in figure 10, attachment 4' has a slotted hole 55 extending in a horizontal plane. In the rest position shown in figure 9, dispensing conduit 9 is situated wholly within attachment 4', while the conduit extends to the outside in the standby position and the tapping position as according to figures 10 and 11 respectively.

A guarantee seal can be added to slotted hole 55, which seal must first be broken before it is made possible for a user to displace dispensing conduit 9 to the standby position by rotating head 43. Slotted hole
55 can thus for instance be provided with a breakable material bridge which extends more or less vertically and which blocks the pivoting movement of dispensing conduit 9. Such a guarantee seal is not drawn.

In a further embodiment the dispensing conduit 9 can be wholly accommodated in a screen in the rest position and be accessible only via slotted hole 55. This slotted hole 55 can be wholly covered with a breakable guarantee seal. In addition to being a tamper-evident feature, this also brings about an effective protection against contamination of dispensing conduit 9.

A guarantee seal must be embodied under all conditions such that it is impossible to repair the seal once it has been broken. This aspect is per se known and does not therefore need further discussion here.

It will be apparent that, in the case of drinks for human consumption, all surfaces and components coming into contact with the beverage must be manufactured from a material approved for this purpose, or be coated therewith.

Cited prior art:
EP-A-O 149 352
US-A-5 110 012
EP-A-I 642 862
CLAIMS

1. Device for dispensing a fluid, which device comprises:
   a sealed vessel in which the fluid is received;
   a carrier for a cartridge with pressurized gas,
   which cartridge has a seal which can be broken by means
   of first operating means which can be operated manually
   from the outside, and the carrier comprises breaking
   means for breaking the seal such that gas is generated
   by the cartridge;
   pressure reducing means which are coupled to the
   carrier and connect to the breaking means for receiving
   pressurized gas, and which generate received gas under
   reduced pressure to the space inside the vessel for
   charging the fluid present therein with gas under a
   certain overpressure;
   a dip tube which extends in the vessel from the
   bottom zone thereof to the inlet of a non-return valve
   which is normally closed under the influence of return
   spring means and the outlet of which debouches on the
   top side of the vessel;
   a dispensing conduit which is present on the top
   side of the vessel and the inlet of which is connected
   sealingly to the outlet of the non-return valve at least
   in the operative position, and the outlet of which in
   that case protrudes outside the vessel for the purpose
   of dispensing fluid;
   second operating means, which can be operated
   manually from the outside in the operative position, for
   displacing the valve body of the non-return valve
   counter to the action of the return spring means,
   whereby the non-return valve is opened, this such that,
   due to the overpressure of the gas in the vessel, fluid
   is pressed via the dip tube, the opened non-return valve
   and the dispensing conduit to the outlet of the
   dispensing conduit, and is there dispensed,
   wherein the breaking means comprise a hollow pin
   for perforating the seal during a relative axial
displacement of the cartridge relative to the breaking means as a result of operating the first operating means; and

wherein a transmission converts a displacement of the first operating means from the rest position to the operative position into said relative axial displacement of the cartridge relative to the hollow pin.

2. Device as claimed in claim 1, wherein the second operating means comprise a manually movable arm.

3. Device as claimed in either of the foregoing claims, wherein the fluid is a beverage such as fruit juice, mineral water, for instance a carbonated drink such as beer, soft drink, carbonated mineral water or the like.

4. Device as claimed in any of the foregoing claims, wherein the vessel is a keg, comprising a base with a body sealingly connected thereto, to the mouth rim of which body an upper wall is sealingly connected, for instance by means of a seam-folded connection.

5. Device as claimed in any of the foregoing claims, wherein the upper wall has a preferably central filling opening which is closed with a plug after the vessel has been filled with fluid.

6. Device as claimed in claim 5, wherein the filling opening is positioned centrally.

7. Device as claimed in any of the foregoing claims, wherein the upper wall of the vessel has two openings, wherein at least one of the carrier, the breaking means, the pressure reducing means, the dip tube, the non-return valve and the dispensing conduit is or are inserted sealingly into the one opening and the other (s) is or are inserted sealingly into the other opening.

8. Device as claimed in claim 7, wherein the carrier, the breaking means and the pressure reducing
means are inserted into a central opening and the dip tube, the non-return valve and the dispensing conduit are inserted into the other opening, and the dispensing conduit is connected to the outlet of the non-return valve via a substantially fluid-tight swivel coupling.

9. Device as claimed in any of the foregoing claims, wherein at least the carrier, the breaking means, the pressure reducing means, the dip tube, the non-return valve and the dispensing conduit are assembled into a first unit, and the upper wall of the vessel has one opening into which this unit is sealingly inserted, optionally in removable manner.

10. Device as claimed in any of the foregoing claims, wherein the arm comprises the dispensing conduit.

11. Device as claimed in claim 10, wherein the arm is pivotable at least more or less parallel to the upper wall of the vessel.

12. Device as claimed in claim 11, comprising: a transmission, which transmits a pivoting movement from the rest position to the operative position of the arm to the first operating means, whereby the breaking means are activated, wherein a push cap is arranged rotatably above the carrier and the breaking means, which push cap is coupled to the arm in a manner locked against rotation and is connected to the carrier and/or the breaking means by means of a screw transmission such that, by pivoting of the arm and corresponding rotation of the push cap, this push cap also undergoes a downward directed displacement and thus presses the cartridge and the hollow pin toward each other such that the hollow pin perforates the seal.

13. Device as claimed in claim 12, wherein the transmission comprises two co-acting toothed wheels and/or gear rings.
14. Device as claimed in claim 10, wherein the projection of the arm in the rest position lies within the periphery of the upper wall of the vessel.

15. Device as claimed in any of the claims 10-14, wherein the arm is connected pivotally to the carrier.

16. Device as claimed in claim 15, wherein the pivot axis substantially coincides with the axis of the carrier.

17. Device as claimed in claim 16, wherein a push cap is arranged rotatably above the carrier and the breaking means, which push cap is coupled to the arm in a manner locked against rotation and is connected to the carrier and/or the breaking means by means of a screw transmission such that, by pivoting of the arm and corresponding rotation of the push cap, this push cap also undergoes a downward directed displacement and thus presses the cartridge and the hollow pin toward each other such that the hollow pin perforates the seal.

18. Device as claimed in any of the foregoing claims, wherein the second operating means comprise a tap handle.

19. Device as claimed in either of the claims 7 or 8, wherein an attachment is coupled in optionally releasable manner to the upper peripheral edge of the vessel, in which attachment the components protruding above the upper peripheral edge of the vessel are received in substantially recessed manner in the rest position such that the device is stackable with like devices.

20. Device as claimed in claim 19, wherein the attachment bears the first and the second operating means.
21. Device as claimed in claim 20, wherein the attachment is coupled in at least tensively strong manner to the vessel.

22. Device as claimed in claim 19, wherein the attachment has a through-hole serving as carrying handle.

23. Device as claimed in any of the claims 19-22, wherein the tap handle is supported pivotally in a vertical plane by the attachment and is adapted to exert a pressure force directed counter to the action of the return spring means on the valve body of the non-return valve in order to open the non-return valve.

24. Device as claimed in any of the foregoing claims, wherein the outlet of the non-return valve has a certain flexibility such that the dispensing conduit can be placed relative thereto from the rest position into the operative position, and the mutual sealing of the outlet of the non-return valve and the inlet of the dispensing valve is ensured in the operative position.

25. Device as claimed in any of the foregoing claims, wherein the outlet of the non-return valve and the inlet of the dispensing conduit are chamfered in corresponding manner.

26. Device as claimed in any of the foregoing claims, comprising guarantee seal means, which can be broken only in outwardly recognisable manner and only in broken state enable displacement of the first operating means from the rest position and/or breaking of the seal of the cartridge with pressurized gas.

27. Device as claimed in claim 11, wherein the attachment has a slotted hole which serves to allow passage of the arm during its pivoting movement from the rest position to the operative position.
28. Device as claimed in claims 11 and 27, wherein the guarantee seal means are added to the slotted hole in a manner such that the arm can be displaced from its rest position to its operative position only after the guarantee seal means have been broken.

29. Device as claimed in claim 28, wherein in the rest position the arm can be in contact with the atmosphere only via the slotted hole and in the rest position the guarantee seal means wholly cover the slotted hole.

30. Device as claimed in any of the foregoing claims, wherein covering means are added to the first operating means, which covering means cover the outlet of the non-return valve in the rest position.
INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2007/000261

A. CLASSIFICATION OF SUBJECT MATTER

INV. B67D1/04

According to International Patent Classification (IPC) onto both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B67D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>NL 7 013 093 A (BALTIZER WALTER) 5 March 1971 (1971-03-05) pages 3,4; figures 1-3</td>
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Date of actual completion of the international search 25 January 2008
Date of mailing of the international search report 04/02/2008

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