

**Device for extracting a substance for the preparation
of a drink**

5 The present invention relates to a device for
extracting a substance for the preparation of a drink.

A device is already known for extracting closed
flexible bags containing at least one substance for the
preparation of a drink. Patent WO 94/02 059, in the
name of the applicant, relates to such a device
10 comprising an upper piece equipped with means intended
to perforate the upper face of the bag, a lower piece
possessing elements in relief and recessed elements
constituting the flow zone, and fixing means fixing the
said upper and lower pieces solidly together. The
15 problem with this device is that the lower and upper
pieces are not linked together, which may cause the
following problem: the movable part is lowered onto the
fixed part, but it is lowered insufficiently far, which
may result in the fixing means not locking the upper
20 part/lower part assembly. This would make it impossible
to extract the bags.

The object of the present invention is to
develop a substance-extracting device for the
preparation of a drink in which there is no longer any
25 risk of absence of locking between the upper and lower
pieces, so as to reliably guarantee extraction with
good sealing of the substance to be extracted.

The present invention relates to a device for
extracting a substance for the preparation of a drink,
30 comprising

- a first, fixed piece and
- a second piece, movable relative to the first
about an axis of rotation lying at the rear of the said
two pieces, the front of each piece supplying a cavity
35 for the substance to be extracted,
- the said device further comprising a system for
closing and opening the two pieces, the said system
possessing a two-armed closing lever and two traction
rods, the two arms of the closing lever being fixed to

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rotate about a first pivot on either side of the second piece, the traction rods being fixed to rotate about a second pivot on either side of the first piece, and the ends of the two arms of the closing lever and of the traction rods being solidly fixed by means of a third, movable pivot so as to interact mutually in order to cause the closing and opening of the device.

The value of the device according to the invention is that the first and second pieces are solidly fixed at all times, which means that, when the opening and closing system is actuated, the second, movable piece is gradually brought towards the first, fixed piece until complete locking of the two pieces relative to one another. There can be no absence of locking, or, therefore, any absence of sealing during extraction.

A cavity is provided for the substance to be extracted. This cavity may be provided in order to place therein a closed cartridge, for example a cartridge as described in EP 0 512 468 and EP 0 602 203 in the name of the applicant. There is, however, no restriction on also being able to use the device according to the invention for other closed bags, capsules or cartridges. It is also possible to use the device according to the invention for open cartridges, for example cartridges made from plastic or bags made from filter paper or from nonwovens.

The substance contained in the closed, open or other cartridge is a pulverulent substance for the preparation of a drink. This substance is preferably roasted and ground coffee, but may also be tea, instant coffee, a mixture of ground coffee and instant coffee, a chocolate-flavoured product or any other dehydrated edible substance.

The description of the functioning of the device according to the invention will be explained in more detail with reference to the figures. It may however be said at this point that it operates in the following manner:

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- the cartridge is placed in its cavity in the first piece, which is fixed,

- the consumer then operates the closing system: he pulls the closing lever towards him, which raises the traction rods and lowers the second, movable piece towards the first piece. At the end of travel of the closing lever, the two pieces are in the closed position. At this point, the first, the second and the third pivots are substantially in the same vertical plane at the rear of the cavity for the substance to be extracted.

In a preferred embodiment of the device according to the invention, in the closed position of the two pieces, the third pivot connecting the two closing-lever arms and the traction rods is substantially in front of the plane formed by the other two pivots. This configuration makes it possible to guarantee beyond any doubt good securing and perfect sealing of the device according to the invention. In front of the plane formed by the other two pivots is here understood as meaning moving towards the cavity for the substance to be extracted.

There is also a risk of absence of sealing when the device according to the invention is closed, because the lower part of the cavity in the second piece is not always exactly parallel to the matching part of the first, fixed piece. To eliminate this risk, provision is made for the second, movable piece to comprise a cavity for the substance to be extracted which is movable on a spherical joint. In this embodiment, the centre of the spherical joint is substantially at the centre of the plane where the sealing of the cavity of the substance to be extracted takes place. It is thus possible to make good any defect of parallelism and eliminate any risk of defective sealing.

If the device according to the invention is used for the extraction of closed cartridges, it is necessary to arrange in the second, movable piece a

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needle allowing the entry of water and in the first, fixed piece a plate having recessed elements and elements in relief, such as those mentioned in patents EP 0 512 470 and EP 0 604 615 in the name of the
5 applicant.

The remainder of the description is given with reference to the drawings, in which:

Fig. 1 is a lateral view of the device according to the invention in the open position,

10 Fig. 2 is a lateral view of the device according to the invention in the process of closing,

Fig. 3 is a lateral view of the device according to the invention in the process of closing,

15 Fig. 4 is a lateral view of the device according to the invention in the closed position,

Figs 5, 6, 7 and 8 are perspective views of the stages of closing shown in Figs 1, 2, 3 and 4, and

Figs 9 and 10 are partial sections showing the spherical joint in more detail.

20 The device comprises:

- a first, fixed piece (1) and
- a second piece (2), movable relative to the first about an axis of rotation (3) lying at the rear of the said two pieces, the front of each piece (1, 2) supplying a cavity (4) and (5) respectively for the
25 substance to be extracted,
- the said device further comprising a system for closing and opening the two pieces, the said system possessing a two-armed closing lever (6) and two
30 traction rods (7).

The closing lever (6) comprises the gripping part (8) and the lever part as such which possesses an elbow of virtually 90°. The traction rod may be straight or, as in the figure, with inward-curving
35 ends. The cavity (4) comprises a peripheral rim (9) and the cavity (5) a peripheral rim (10).

The two arms of the closing lever (6) are fixed to rotate about a first pivot (11) on either side of the second piece (2) and the traction rods (7) are

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fixed to rotate about a second pivot (12) on either side of the first piece (1). The two ends of the two arms of the closing lever, opposite the gripping part (8), and the two ends of the traction rods (7) are
5 solidly fixed by means of a third, movable pivot (13), so that the closing lever interacts with the rods to cause the closing and opening of the device according to the invention.

Adopting the sequences shown in Figures 1 to 4
10 and 5 to 8, the functioning of the device according to the invention is as follows:

The consumer places in the cavity (4) a capsule or cartridge to be extracted (not shown): Figs 1 and 5. He then pulls the gripping part (8) of the closing
15 lever (6) forwards in the direction of the arrow A, so as to cause the said lever to rotate about its pivot 11, which then draws the traction rod (7) upwards along the pivot 13 and causes the movable part (2) to descend (arrow B) towards the fixed part (1): Figures 2, 3 and
20 6, 7. The closed position is reached when the closing lever is substantially in the horizontal position and the traction rods in the vertical position: Figures 4 and 8. At this point, the peripheral rims (9, 10) of the cavities (4, 5) are face to face and must ensure
25 good sealing of the device.

The device according to the invention is incorporated into a coffee-making machine comprising conventional elements, specifically a tank for the water, a heating element, a pump for bringing the water
30 to the cavity (5) and water intake ducts. These various elements have not been shown in the Figures. When the device is in the totally closed position (Figs 4 and 8), the pump can be activated to bring the water into the cavities (4, 5): the water then flows onto the
35 substance to be extracted, for example coffee, and the drink flows below the piece (1) into a cup (not shown).

At the end of extraction, the consumer unlocks the device by raising the closing lever (6) upwards, which causes the traction rod (7) to pivot backwards

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about its axis of rotation (12) and raises the movable part (2). The consumer can thus remove the extracted cartridge and the device is thus ready for a repeat extraction.

5 Figures 9 and 10 show a specific embodiment of the device according to the invention in the form of a schematic section. The cavity has not been shown on the fixed part (1), because it is primarily to the movable part (2) that the feature relates. This part (2)
10 possesses a cavity (5) having a lower peripheral rim (10). The capsule to be extracted is shown at (20). The cavity 5) is movable on a spherical joint (22), whose centre (21) is substantially at the mid-point between the two cavities (4, 5). When the piece (2) is closed,
15 the cavity can shift, depending on the contours of the capsule (20), and the rim (10) adjusts to bear correctly against the rim (9) of the cavity (4).



Claims

1. Device for extracting a substance for the preparation of a drink, comprising
 - 5 - a first, fixed piece and
 - a second piece, movable relative to the first about an axis of rotation lying at the rear of the said two pieces, the front of each piece supplying a cavity for the substance to be extracted,
 - 10 - the said device further comprising a system for closing and opening the two pieces, the said system possessing a two-armed closing lever and two traction rods, the two arms of the closing lever being fixed to rotate about a first pivot on either side of the second
 - 15 piece, the traction rods being fixed to rotate about a second pivot on either side of the first piece, and the ends of the two arms of the closing lever and of the traction rods being solidly fixed by means of a third, movable pivot so as to interact mutually in order to
 - 20 cause the closing and opening of the device.
2. Device according to Claim 1, characterized in that the cavity for the substance to be extracted is a cavity for a closed cartridge, for an open cartridge and for any other packaging of the substance to be
- 25 extracted.
3. Device according to one of Claims 1 and 2, characterized in that, in the closed position of the two pieces, the first, the second and the third pivots are substantially in the same vertical plane at the
- 30 rear of the cavity for the substance to be extracted.
4. Device according to Claim 3, characterized in that, in the closed position of the two pieces, the third pivot connecting the two closing-lever arms and the traction rods is substantially in front of the
- 35 plane formed by the other two pivots.
5. Device according to one of Claims 1 to 4, characterized in that the second piece comprises a cavity for the substance to be extracted which is movable on a spherical joint.



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6. Device according to Claim 5, characterized in that the centre of the spherical joint is substantially at the centre of the plane where the sealing of the cavity of the substance to be extracted takes place.