Device for extracting a substance

The present relates to a device for extracting a substance for the preparation of a drink from a cartridge.

A device for extracting a substance for the preparation of a drink is already known. Patent EP 512 470 relates to a system for the extraction of sealed cartridges. The problem with this system is that the consumer has to stay by the machine throughout in order to stop the extraction, remove the used cartridge and insert a fresh cartridge for a second cup of coffee. The object of the present invention is to provide a device for extracting cartridges, from which it is possible to obtain two drinks without the consumer having to take any action.

The present invention relates to a device for extracting a substance, in which the consumer places the first cartridge to be extracted, immediately followed by the second cartridge to be extracted, and can then leave the machine to automatically prepare both drinks. This device is very useful in offices, in the home and anywhere where the user has to deal with other tasks during the extraction, as for example in cafés, hotels, restaurants, and so forth.

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

- a frame with a base, a vertical part on the said base and a horizontal part situated at a certain distance from the base,
- a moveable drawer able to slide over the horizontal part of the frame in order to move the cartridge from its insertion position to a drink-preparing position over a system of elements for the discharge of the said drink on the said horizontal part and
- a cartridge extraction system situated over the system of drink discharge elements and able to

move towards the said system of elements to trap and extract the cartridge.

It is also possible in the device according to the invention to extract sealed cartridges, such as those dissealed in Patents EP 512 468 and EP 602 203 in the applicant's name. The device can also be used to extract other sealed cartridges, capsules or sachets. It is also possible to use the device according to the invention for open cartridges, such as plastic cartridges or filter-paper sachets made of nonwoven materials.

The substance contained in the sealed, open or other cartridge is a powder substance for the preparation of a drink. This substance is preferably roasted ground coffee, but can also be tea, instant coffee, a blend of ground coffee and instant coffee, a chocolate-based product or any other dehydrated substance suitable for consumption.

The distance between the base and the horizontal part of the frame is approximately slightly greater than the height of the cup into which the coffee will be poured.

The moveable drawer of the device comprises a part shaped like an arc of a circle and, when the said drawer moves, moves the cartridge into the position in which it will be extracted. The drawer moves back to pull the cartridge and immediately returns to its initial position, allowing another cartridge to be inserted at once.

The extraction system utilized may be for example that forming the subject matter of Patent EP 242 556. If the device according to the invention is used for extracting sealed cartridges, the drink discharge elements must be in the form of a plate with relief and recessed elements, such as those referred to in Patents EP 512 470 and EP 604 615 in the applicant's name.

The cartridge extraction system is supported by two vertical means on the horizontal part of the frame,

external to the moveable drawer. The guides are held in position by a system of bolts.

In the device according to the invention, the system of drink discharge elements is part of an ejector for expelling used cartridges at the rear of the device which is actuated when the extraction system rises.

The extraction system includes a cartridge cage, for example that forming the subject-matter of Patent EP 242 556, mentioned above, which is moved towards the drink discharge elements by a piston. This piston is driven by a motor.

As indicated above, the device according to the invention is capable of making two cups of coffee one after the other. For this purpose there is provided, beneath the drink discharge elements, a discharge channel with two positions for filling two cups in succession. This discharge channel is driven by a motor.

There are therefore three motors in the device according to the invention: one for moving the drawer, one for raising and lowering the cartridge extraction system and the third for the discharge channel.

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

Fig. 1 is an illustration of the device according to the invention in perspective, shown empty,

Fig. 2 is an illustration similar to that of Fig. 1 with a cartridge to be extracted,

Fig. 3 is an illustration of the device in operation,

Fig. 4 is an illustration of the device following extraction and

Fig. 5 is an illustration in cross section of the extraction system taken on A-A as marked in Fig. 3.

The frame of the machine comprises a base (16), a vertical part (17) and a horizontal part (18). A moveable drawer (19) is situated on the abovementioned horizontal part. This drawer comprises a front part

(20) in the shape of an arc of a circle. The horizontal part comprises a system of elements (21) for discharging the drink, this system being part of an ejector (22) for expelling extracted cartridges at the rear (23) of the machine. The extraction system (24) is supported by two vertical guides (25), held in position by bolts (26), and includes a hot-water inlet as indicated at arrow A. Elements (27) and (28) guide the extraction system (24) and keep it in position. The discharge channel (29) conveys the coffee into the cup (30).

Figure 5 shows a section through the device according to the invention during the extraction of the cartridge (33). The extraction system comprises a cartridge cage (8) containing the cartridge (33). The hot water from A arrives via the injection member (6), which has two holes (7), and enters the cartridge (33). The gearwheel (35) is driven by a motor (not shown) and enables the extraction system (24) to be lowered and raised. The hook (32) is for removing the used cartridge from the cartridge cage (8).

The device according to the invention works as follows: Figure 1 shows the device when empty with no cartridge, the extraction system (24) raised and the moveable drawer (19) in the forward position. The ejector (22) comprises a drive means (not shown) which tips the said ejector back to expel the used cartridge. The water inlet is indicated by the arrow A.

Figure 2 shows the two cups (30) and (31) underneath the discharge channel (29) and the cartridge to be extracted (33) is positioned in the moveable drawer (19) at the front end (20) which is shaped as an arc of a circle. The consumer wishes to prepare a cup of coffee and presses the button (not shown) of the machine to start the preparation of the first cup of coffee. The signal to start is electronically transmitted and the moveable drawer moves in the direction of arrow B, taking the cartridge (33) onto the system (21) of drink discharge elements. The

moveable drawer (19) then returns to its initial position and the consumer can insert the second cartridge (34) to be extracted (Fig. 3). The system therefore comprises a first motor (not shown) for the movement of the moveable drawer (19). When the first cartridge (33) is in position, a second motor (not shown) turns the gearwheel (35) which, via an internal thread, engages with the piston (36) of the extraction system (24) and lowers the said extraction system to the position shown in Figure 3, thus creating a good seal for extraction purposes. The hot water then arrives in the direction indicated by A and enters the cartridge (33), and pressure causes the bottom face of the cartridge to open against the system of elements (21), so that the coffee discharges through the discharge channel (29) into the cup (30).

When extraction is complete, the second motor raises the extraction system (24), and as it rises the hook (32) removes the used cartridge from the capsule cage, the ejector (22) being activated by a means that is not illustrated, in order to tip the cartridge (33) towards the rear of the machine (Fig. 4). The machine is now once again in the position shown in Figure 2 with the cartridge (34) ready to be extracted. A third motor (not shown) now moves the discharge channel (29) into position for filling the cup (31). The extraction follows the same steps as for the extraction of the cartridge (33).

After having inserted the cartridge (33), immediately followed by the cartridge (34), the consumer can leave the machine to carry out the two extraction operations. A few minutes later he returns and finds two cups of coffee ready. He can then recommence the procedure for two more cups of coffee.

Claims

1. Device for extracting a substance for the preparation of a drink from a cartridge, comprising

- a frame with a base, a vertical part on the said base and a horizontal part situated at a certain distance from the base,
- a moveable drawer able to slide over the horizontal part of the frame in order to move the cartridge from its insertion position to a drink-preparing position over a system of elements for the discharge of the said drink on the said horizontal part and
- a cartridge extraction system situated over the system of drink discharge elements and able to move towards the said system of elements to trap and extract the cartridge.

2. Device according to Claim 1, in which the cartridge extraction system is supported by two vertical means on the horizontal part of the frame, external to the moveable drawer.

3. Device according to either of Claims 1 and 2, in which the system of drink discharge elements is part of an ejector for expelling used cartridges at the rear of the device which is actuated when the extraction system rises.

4. Device according to one of Claims 1 to 3, in which the extraction system includes a cartridge cage which is moved towards the drink discharge elements by a piston.

5. Device according to one of Claims 1 to 4, in which there is provided, beneath the drink discharge elements, a discharge channel with two positions for filling two cups in succession.