FR 2 565 088 shows a metering device in the form of a chamber between a coffee bean container and a grinder. The metering device is rotated about a horizontal axis so as to feed a pre-defined quantity of beans into the grinder.

DISCLOSURE OF THE INVENTION

It is therefore an object of the invention to achieve an apparatus which in a simple manner enables a coffee beverage to be prepared in an optimal manner without the coffee aroma being compromised by previous preparations and without the user having to carry out time-consuming adjustments on the coffee apparatus.

SUMMARY

In a first aspect, the present disclosure refers to a unit of a coffee apparatus, in particular of a coffee machine for brewing a coffee beverage, wherein the unit has a coffee bean container for storing the coffee beans, a portioning device for metering the coffee beans for the coffee beverage, and a grinder for grinding the metered coffee beans, wherein the coffee bean container and the portioning device are configured in a common container module, wherein the unit has a module receptacle to which the container module when in use is connectable and from which said container module after use is removable, and wherein the container module has user-selectable settings of a metered quantity and of a grinding degree, wherein the setting of the metered quantity affects the portioning device and the setting of the grinding degree affects the grinder.

In a second aspect, the present disclosure refers to a unit of a container module, in particular of a unit of the first aspect, wherein the container module has a coffee bean container for storing the coffee beans and a portioning device for metering the coffee beans for the single portion, wherein the container module has connecting means for releasably connecting to the module receptacle of the coffee apparatus, and wherein the container module has user-selectable settings of a metered quantity and of a grinding degree, wherein the setting of the metered quantity affects the portioning device, and the setting of the grinding degree affects the grinder.

In a third aspect, the present disclosure refers to a unit of a coffee apparatus, in particular of a coffee machine for brewing a coffee beverage, wherein the unit has a coffee bean container for storing the coffee beans, a portioning device for metering the coffee beans for the coffee beverage, and a grinding degree setting device for mechanically and operatively connecting to a grinder for grinding the metered coffee beans, wherein the coffee bean container and the portioning device are configured in a common container module, wherein the unit has a module receptacle to which the container module when in use is connectable and from which said container module after use is removable, and wherein the container module has user-selectable settings of a metered quantity and of a grinding degree, wherein the setting of the metered quantity affects the portioning device and the setting of the grinding degree by means of the grinding degree setting device affects the grinder.

This object is achieved by a unit of a coffee apparatus, in particular of a coffee machine, having the features of the first or third aspect, respectively, as well as a container module having the features of the second aspect.

The unit according to an example of a coffee apparatus, in particular of a coffee machine for brewing a coffee beverage or of an espresso coffee mill, has a coffee bean container for storing the coffee beans, a portioning device for metering the coffee beans for a coffee beverage, and a grinder for grinding the metered coffee beans. The coffee bean container and the portioning device are configured in a common container module. The unit has a module receptacle to which the container module when in use is connectable and from which said container module after use is removable. The container module has user-selectable settings of a metered quantity and of a grinding degree, wherein the setting of the metered quantity affects the portioning device and the setting of the grinding degree affects the grinder.

A coffee apparatus in this text is understood to be a coffee machine having a grinder and a brewing apparatus, or else a coffee mill which in terms of the housing grinds coffee beans separately from a brewing apparatus but can make available said coffee beans for use soon or directly thereafter, respectively, in a brewing apparatus. Said coffee mills are usually referred to as espresso coffee mills wherein said espresso coffee mills, depending on the

example, can also provide coffee powder for lungo coffees and dual-portion coffees in

module does not have to have any electronic components, said container module can be produced in a relatively cost-effective manner. In other embodiments, in particular for the hospitality sector or for machines in a higher price category, the container module preferably also has electronic components.

In simple examples, all of the settings are performed manually, and the effect of the settings on the portioning device or the grinder, respectively, takes place by mechanical means. In other examples, parts thereof are electronically controlled.

Depending on the example, the machine is started, that is to say the grinding procedure and the brewing procedure are performed, after carrying out the settings on the portioning device and on the grinder. In other examples, a brewing program can be set on the machine, for example the brewing temperature and/or the duration of the grinding procedure and/or of the brewing procedure, depending on the type of coffee or the individual requirements of the user. In further examples, the container module has corresponding instructions to the user or to the control system of the coffee machine. If the control system of the coffee machine is to automatically implement these additional items of information, a reading apparatus for identifying said items of information pertaining to the type of coffee or other settings and for transmitting said items of information to the control system is preferably present in the receptacle module or at another suitable location of the coffee machine.

The setting of the metered quantity and/or the setting of the grinding degree are/is preferably able to be carried out manually. Depending on the example, one or both of said settings is/are to be able to be carried out prior to connecting the container module to the module receptacle. On account thereof, the desired settings can be performed already when filling the container, and all settings have been preset in the desired manner when said container is used. Moreover, filled containers of this type can already be marketed with recommended pre-settings. Moreover, fresh setting does not have to be performed for each new use, wherein the setting can however of course also be changed for every new use. In other examples, one of the settings, or both of the settings, is/are alternatively or additionally still able to be changed even after connecting the container module to the module receptacle. On account thereof, different variants of settings can be tested without the container module

having to be removed between said settings.

In an example a rotation safeguard which prevents the portioning device from being prematurely emptied is present. This rotation safeguard is preferably cancelled when the container module is fastened or placed, respectively, almost completely or completely on the coffee apparatus.

The module receptacle preferably establishes a connection between the portioning device and the grinder, wherein the module receptacle and the grinder are disposed on or in a housing of the coffee machine. On account thereof, the unit is configured in a compact manner, and coffee machines for private use can also be configured using this unit.

In one example, the settings of the metered quantity and of the grinding degree are performed mechanically. The effect of the settings on the portioning device and on the grinder likewise preferably takes place mechanically. This is a simple, robust and cost-effective solution, in particular for machines for private use.

In other examples, the settings of the portioning device and/or of the grinder are performed electronically.

In one example, the effect of the setting of the grinder takes place by way of a sensor which is disposed in the module receptacle, wherein the sensor communicates with the control system of the apparatus.

In one example, the container module has a writable data memory for communicating with a read/write unit of the module receptacle, wherein at least data pertaining to a current grinding degree setting of the grinder is able to be stored in the data memory.

In an example, the portioning device after connecting the container module to the module receptacle is activatable by means of a drive which is external to the container module, so as to provide a selected metered quantity in the portioning device and to supply said metered quantity to the grinder. This solution minimizes the susceptibility to errors and simplifies the operation of the coffee machine. The user just has to dock the container module

to the machine and switch on the machine.

The portioning device preferably has a metering chamber, wherein the received volume of the metering chamber is variable for the purpose of setting the metered quantity. The metering chamber is a simple and cost-effective means for processing coffee beans in the desired quantity. Sensors or other energy-consuming measuring means on the container module can be dispensed with on account thereof. The container module can thus be embodied in a relatively simple and cost-effective manner. Said container module, in particular in the absence of electronic components, can in particular be configured so as to be completely washable.

In one example, the portioning device has a first rotating disk and a second rotating disk, the mutual spacing of said disks being variable, and said first rotating disk and said second rotating disk being conjointly rotatable relative to the coffee bean container and relative to a base of the portioning device. The metering chamber is configured between the first rotating disk and the second rotating disk, wherein the metering chamber, depending on the rotary position of the first rotating disk and the second rotating disk, is open in relation to either of the two components of coffee bean container and grinder and closed in relation to the other of said two components.

In one example, the portioning device has a first chamber part and a second chamber part, said chamber parts being mutually displaceable in the axial direction. The metering chamber is configured between the first chamber part and the second chamber part. The metering chamber, depending on the rotary position of at least one of the two chamber parts, is open in relation to either of the two components of coffee bean container and grinder and closed in relation to the other of said two components.

These configurations of a metering chamber can also be used in other coffee machines, that is to say so as not to be coupled to the container module according to an example. Said configurations of a metering chamber are therefore likewise claimed as a separate invention.

A setting ring which is disposed so as to be rotatable on a circumference of the coffee bean container is preferably present for setting the metered quantity. Depending on the

example, the coffee bean container or the portioning device when setting rotates conjointly with the setting ring relative to the remaining part of the module housing. However, in one example, the coffee bean container, and preferably likewise the remaining housing of the container module, do not conjointly rotate with said setting ring.

In an example the grinder has two grinding disks, wherein at least one of the two grinding disks as a function of the setting of the grinding degree is displaceable when or after connecting the container module to the module receptacle.

In an example the container module has a grinding degree setting device which when connecting the container module to the module receptacle is able to be mechanically and operatively connected to the grinder, on account of which the spacing of grinding disks of the grinder is varied.

A non-rotating fixed grinding disk is preferably displaceable by means of the setting, and a rotating race disk is not displaceable by means of the setting. The arrangement is the exact reverse in other embodiments, that is to say that the fixed grinding disk is not displaceable by means of the setting, and the race disk is correspondingly displaceable.

The setting of the grinding degree on the container module is preferably able to be operatively connected to a rotatable setting disk of the module receptacle, wherein the setting disk is operatively connected to a rotatable union nut of the grinder, and wherein a first grinding disk by virtue of the rotation of the union nut is displaceable relative to a second grinding disk such that the spacing of said disks is varied. Preferably a non-rotating is a fixed grinding disk, and the second grinding disk is a rotating race grinding disk.

This configuration of the displaceable fixed grinding disk and the axially non-displaceable race disk, in particular when said disks are disposed so as to be horizontal or almost horizontal, can also be used in other coffee machines, that is to say so as not to be coupled to the container module according to an example. This example is therefore likewise claimed as a separate invention.

The container module preferably has a setting means for setting the grinding degree, wherein said setting means is disposed on the lower side or on the circumference of the container module. The configuration on the circumference has the advantage that the setting means is better accessible and the container does not have to be tilted or even placed upside down in order for the setting to be changed. In one example, said setting means is a setting ring which is disposed so as to be rotatable on a circumference of the coffee bean container. The setting ring for setting the grinding degree is preferably also rotatable relative to the coffee bean container and preferably also relative to the remaining part of the external housing of the container module. “Rotatable” in the entire text is understood so as to be also pivotable about an angle of less than 360°, where this is technically expedient.

In an example, the setting of the grinding degree is also manually variable in the case of an mounted container module. The setting of the grinding degree in the case of an mounted container module can preferably be varied in the direction of a finer grinding degree as well as in the direction of a coarser grinding degree.

In an example, the coffee bean container is releasably connected to the portioning device, wherein the portioning device conjointly with a grinding degree setting device for setting the grinding degree forms a sub-module which is configured for connecting to the module receptacle. This releasable connection enables more simple cleaning of the container module and moreover enables that single-use coffee bean containers can be used which are disposed of after having been completely emptied.

The grinder preferably has a conveying rotor which drives the grinding disk, that is to say a rotor shaft or a rotating axle which is disposed so as to run almost or exactly horizontally, and which is connected to an electric motor. Preferably a horizontal grinder is thus used. This saves space and better guarantees that the grinder can be completely emptied after each grinding procedure.

In an example the grinder has a bean inlet duct which is configured so as to be arcuate. This facilitates the complete and gentle emptying of the metering chamber and guarantees optimum feeding of the conveyed coffee beans into the grinder. The conveying rotor preferably extends into the bean inlet duct. This arrangement guarantees that all coffee

beans are conveyed through the grinder and are thus ground by the latter. The grinder and in particular the coffee powder outlet thereof are designed such that no ground coffee powder is left behind but the entire metered quantity of the ground coffee beans in each case makes its way into the brewing unit.

The container module according to an example has a coffee bean container for storing the coffee beans and a portioning device for metering the coffee beans for the coffee beverage, wherein the container module has connecting means for releasably connecting to the module receptacle of the coffee machine, and wherein the container module has user-selectable settings of a metered quantity and of a grinding degree. The setting of the metered quantity affects the portioning device, and the setting of the grinding degree affects the grinder. A plurality of container modules of this type can be used per coffee machine, wherein said container modules are individually connected to the module receptacle. Depending on the configuration of the coffee machine, said coffee machine may also have a plurality of module receptacles having in each case associated grinders, or having a common grinder for all module receptacles. The grinding degree setting device which mechanically acts on the grinder is preferably likewise part of the container module.

The individual container modules enable different types of coffee having already set parameters for the brewing of the coffee to be stored and for said parameters to be implemented when coupling to the coffee machine without any further input by the user. A simple, cost-effective and simple-to-operate information exchange module between the coffee container and the coffee machine has thus been achieved.

Depending on the field of application, said unit comprises the grinder, or a conventional grinder of which the interface for the grinding disk setting is to be adapted to the unit according to the invention is used. A unit in which the grinder is not part of the unit is therefore also claimed.

Further embodiments are set forth in the dependent claims.

PATENT CLAIMS

1. A unit of a coffee apparatus, in particular of a coffee machine for brewing a coffee beverage, wherein the unit has a coffee bean container for storing the coffee beans, a portioning device for metering the coffee beans for the coffee beverage, and a grinder for grinding the metered coffee beans, wherein the coffee bean container and the portioning device are configured in a common container module, wherein the unit has a module receptacle to which the container module when in use is connectable and from which said container module after use is removable, and wherein the container module has user-selectable settings of a metered quantity and of a grinding degree, wherein the setting of the metered quantity affects the portioning device and the setting of the grinding degree affects the grinder.

2. The unit as claimed in claim 1, wherein the setting of the metered quantity and/or the setting of the grinding degree are/is able to be carried out manually.

3. The unit as claimed in any one of claims 1 or 2, wherein the setting of the metered quantity and/or the setting of the grinding degree are/is able to be carried out prior to connecting the container module to the module receptacle.

4. The unit as claimed in any one of claims 1 to 3, wherein the setting of the metered quantity and/or the setting of the grinding degree are/is able to be carried out after connecting the container module to the module receptacle.

5. The unit as claimed in any one of claims 1 to 4, wherein the module receptacle establishes a connection between the portioning device and the grinder, and wherein the module receptacle and the grinder are disposed on or in a housing of the coffee apparatus.

6. The unit as claimed in any one of claims 1 to 5, wherein the container module has a writable data memory for communicating with a read/write unit of the module receptacle, wherein at least data pertaining to a current grinding degree setting of the

grinder is able to be stored in the data memory.

7. The unit as claimed in any one of claims 1 to 6, wherein the settings of the metered quantity and of the grinding degree are performed mechanically, and wherein the effect of the settings on the portioning device and/or the grinder takes place mechanically.

8. The unit as claimed in claim 7, wherein the module receptacle has a sensor for detecting the setting of the grinding degree on the container module, and wherein the sensor communicates with a control system of the apparatus.

9. The unit as claimed in any one of claims 1 to 8, wherein the portioning device after connecting the container module to the module receptacle is activatable by means of a drive which is external to the container module, so as to provide a selected metered quantity in the portioning device and to supply said metered quantity to the grinder.

10. The unit as claimed in any one of claims 1 to 9, wherein the portioning device has a metering chamber, and wherein the received volume of the metering chamber is variable for the purpose of setting the metered quantity.

11. The unit as claimed in claim 10, wherein the portioning device has a first rotating disk and a second rotating disk, the mutual spacing of said disks being variable, and said first rotating disk and said second rotating disk being conjointly rotatable relative to the coffee bean container and relative to a base of the portioning device, wherein the metering chamber is configured between the first rotating disk and the second rotating disk, and wherein the metering chamber, depending on the rotary position of the first rotating disk and the second rotating disk, is open in relation to either of the two components of coffee bean container and grinder and closed in relation to the other of said two components.

12. The unit as claimed in claim 10, wherein the portioning device has a first chamber part and a second chamber part, said chamber parts being mutually displaceable in the axial direction, wherein the metering chamber is configured between the first chamber part and the second chamber part, and wherein the metering chamber, depending on a

rotary position of at least one of the two chamber parts, is open in relation to either of the two components of coffee bean container and grinder and closed in relation to the other of said two components.

13. The unit as claimed in any one of claims 1 to 12, wherein a setting ring which for setting the metered quantity is disposed so as to be rotatable on a circumference of the coffee bean container is present.

14. The unit as claimed in claim 13, wherein the setting ring is rotatable relative to the coffee bean container.

15. The unit as claimed in any one of claims 1 to 14, wherein the grinder has two grinding disks , wherein at least one of the two grinding disks as a function of the setting of the grinding degree is displaceable when or after connecting the container module to the module receptacle.

16. The unit as claimed in claim 15, wherein the container module has a grinding degree setting device which when connecting the container module to the module receptacle is able to be mechanically and operatively connected to the grinder, on account of which the spacing of grinding disks of the grinder is varied.

17. The unit as claimed in any one of claims 15 or 16, wherein the setting of the grinding degree on the container module is able to be operatively connected to a rotatable setting disk of the module receptacle, wherein the setting disk is operatively connected to a rotatable union nut of the grinder, and wherein a first grinding disk by virtue of the rotation of the union nut is displaceable relative to a second grinding disk such that the spacing of said disks is varied.

18. The unit as claimed in claim 17, wherein the first grinding disk is a non-rotating fixed grinding disk, and the second grinding disk is a rotating race grinding disk.

19. The unit as claimed in any one of claims 1 to 18, wherein the container module has a setting means for setting the grinding degree, wherein said setting means is disposed

on a lower side or on the circumference of the container module.

20. The unit as claimed in claim 19, wherein the setting means is a setting ring which is disposed so as to be rotatable on a circumference of the coffee bean container.

21. The unit as claimed in claim 20, wherein the setting ring for setting the grinding degree is rotatable relative to the coffee bean container.

22. The unit as claimed in any one of claims 15 to 21, wherein the setting of the grinding degree is manually variable in the case of a mounted container module.

23. The unit as claimed in any one of claims 15 to 22, wherein the setting of the grinding degree in the case of a mounted container module is variable in the direction of a finer grinding degree as well as in the direction of a coarser grinding degree.

24. The unit as claimed in any one of claims 1 to 23, wherein a rotation safeguard which prevents the portioning device from being prematurely emptied is present.

25. The unit as claimed in any one of claims 1 to 24, wherein the coffee bean container is releasably connected to the portioning device, and wherein the portioning device conjointly with a grinding degree setting device for setting the grinding degree forms a sub-module which is configured for connecting to the module receptacle.

26. The unit as claimed in any one of claims 1 to 25, wherein the grinder has a conveying rotor which drives the grinding disks, wherein the conveying rotor is disposed so as to run almost or exactly horizontally.

27. The unit as claimed in any one of claims 1 to 26, wherein the grinder has a bean inlet duct, which is configured so as to be arcuate.

28. The unit as claimed in claims 25 and 26, wherein the conveying rotor extends into the bean inlet duct.

29. A container module, in particular of a unit as claimed in any one of claims 1 to 28, wherein the container module has a coffee bean container for storing the coffee beans and a portioning device for metering the coffee beans for the single portion, wherein the container module has connecting means for releasably connecting to the module receptacle of the coffee apparatus, and wherein the container module has user-selectable settings of a metered quantity and of a grinding degree, wherein the setting of the metered quantity affects the portioning device, and the setting of the grinding degree affects the grinder.

30. The container module as claimed in claim 29, wherein the container module has a grinding degree setting device for setting the grinding degree, wherein the grinding degree setting device, which when connecting the container module to the module receptacle is able to be mechanically and operatively connected to the grinder, on account of which the spacing of grinding disks of the grinder is varied.

31. A unit of a coffee apparatus, in particular of a coffee machine for brewing a coffee beverage, wherein the unit has a coffee bean container for storing the coffee beans, a portioning device for metering the coffee beans for the coffee beverage, and a grinding degree setting device for mechanically and operatively connecting to a grinder for grinding the metered coffee beans, wherein the coffee bean container and the portioning device are configured in a common container module, wherein the unit has a module receptacle to which the container module when in use is connectable and from which said container module after use is removable, and wherein the container module has user-selectable settings of a metered quantity and of a grinding degree, wherein the setting of the metered quantity affects the portioning device and the setting of the grinding degree by means of the grinding degree setting device affects the grinder.