



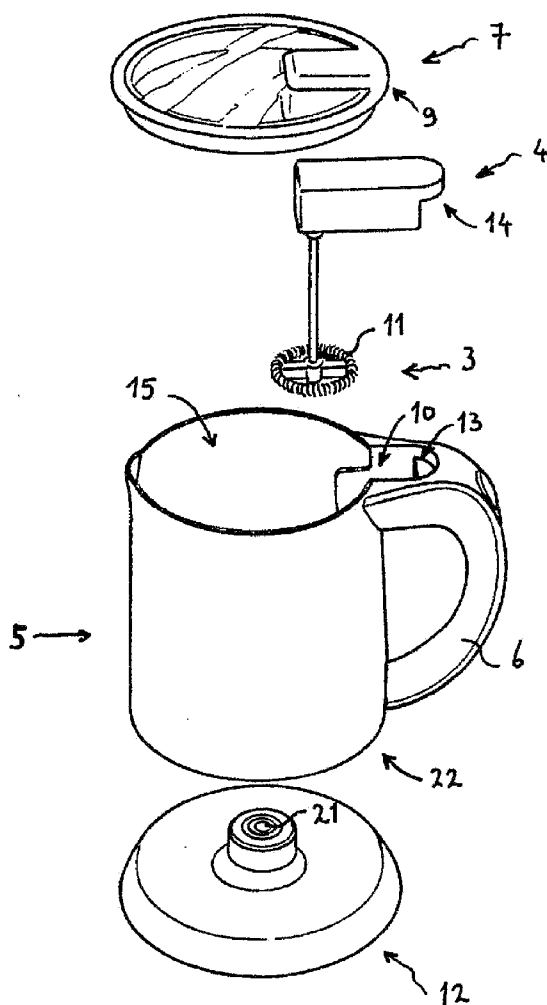
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(19) **United States**(12) **Patent Application Publication**
ELISSEN(10) **Pub. No.: US 2012/0017778 A1**(43) **Pub. Date: Jan. 26, 2012**(54) **MILK FROTHER****Publication Classification**(75) Inventor: **PETRUS ADRIANUS**
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Laren (NL)(73) Assignee: **FOREMOST BV**, Eemnes (NL)(21) Appl. No.: **13/247,709**(22) Filed: **Sep. 28, 2011****Related U.S. Application Data**(63) Continuation of application No. 12/440,642, filed on
Mar. 10, 2009, now Pat. No. 8,042,456, filed as appli-
cation No. PCT/NL2008/000186 on Aug. 1, 2008.(30) **Foreign Application Priority Data**

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A23C 9/00 (2006.01)(52) **U.S. Cl. 99/453; 366/251**(57) **ABSTRACT**

Methods and devices for frothing milk. The device includes a main body that forms a container for the milk, a cover fitting onto the main body, an agitator for frothing milk and a driver for driving the agitator. The driver is received at least partially in the cover. The driver is provided with a driver electric contact. The main body is provided with an upper main body electric contact and a first recess for receiving at least partially the driver. The first recess and the driver are shaped in such a way that electrical contact between the driver electric contact and the upper main body electric contact automatically is made when the cover is fitted on the main body and the first recess receives at least a part of the driver.



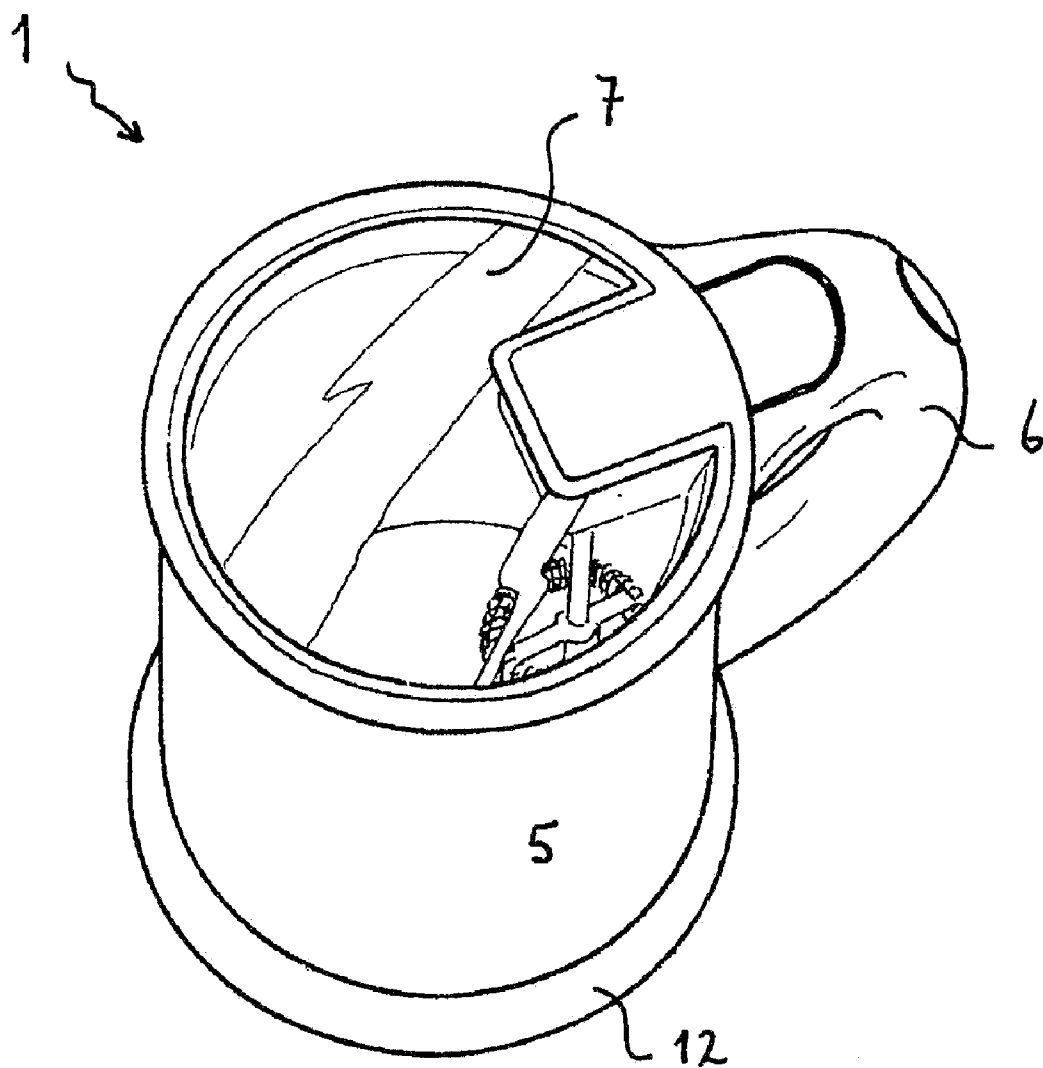


FIG. 1A

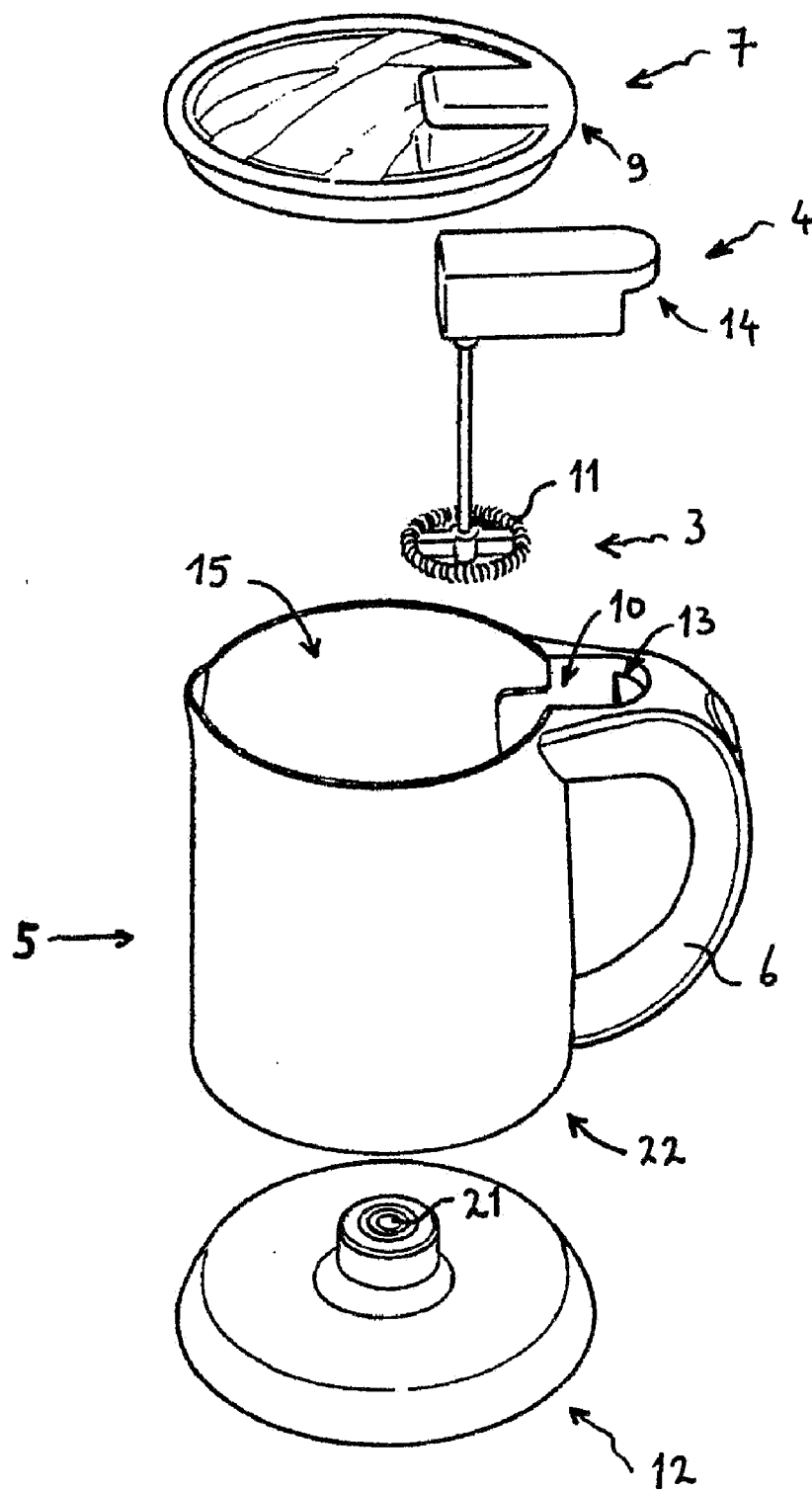


FIG. 1B

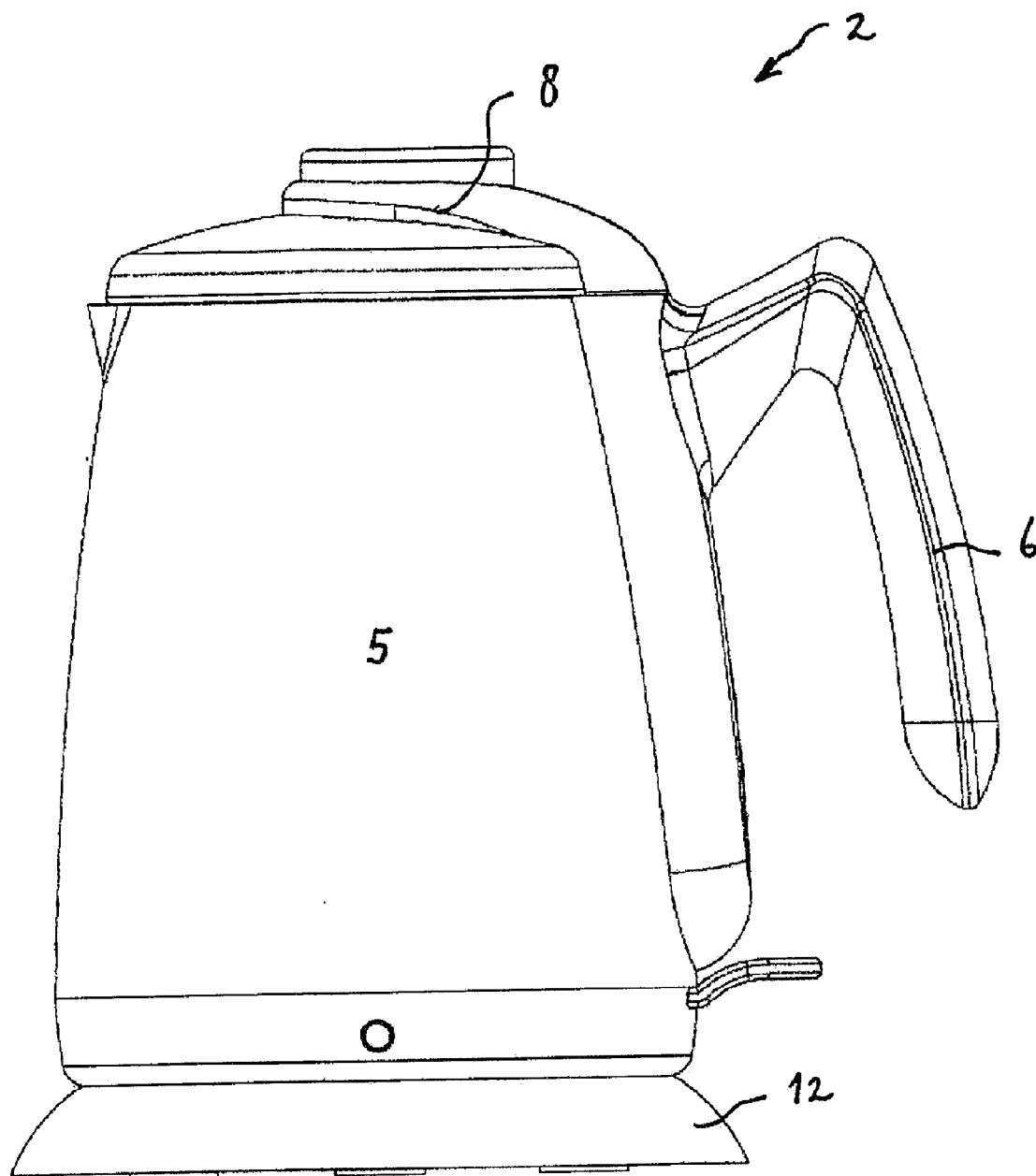


FIG. 2A

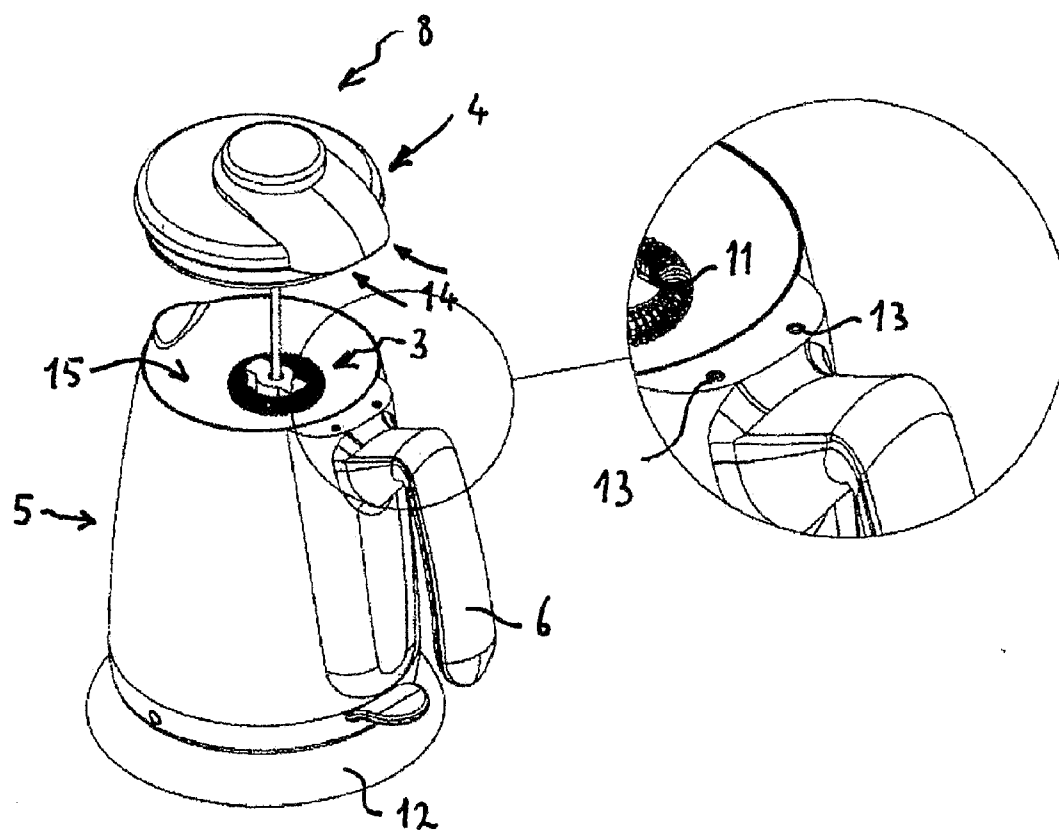


FIG. 2B

MILK FROTHER

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application is a continuation of and claims priority to U.S. patent application Ser. No. 12/440, 442, titled "Milk Frother," which was filed on Mar. 10, 2009, and which claims the priority of PCT Application No. PCT/NL2008/000186, filed on Aug. 1, 2008, which application in turn claims the priority of Dutch Patent Application No. NL-1034240, filed on Aug. 8, 2007. All of these applications are incorporated herein by reference.

BACKGROUND

[0002] This invention relates to a device for frothing milk. Devices for frothing milk are known. In addition to the frequently applied frothers based on steam, frothers on the basis of an agitation element to be immersed in the milk have been known for many years and in diverse embodiments. The agitation element is here driven 'from above' or 'from below' by hand, electromechanically or magnetically. In DE102004043579 we thus find a rechargeable handheld milk frother with a rotating annular spiral spring, which must be immersed in the milk to be frothed. In GB384569 we find an example of a mixer for liquids, comprising a frame consisting of a base and a stand having mounted thereon a housing with an electric motor, which drives a shaft on which a stirrer or mixer head is mounted. A container with a liquid for mixing must be placed on the base. In U.S. Pat. No. 5,912,039 we find an example of a milk frother comprising a frame consisting of a base and a stand having mounted thereon an electric motor and a mixer, which has to be immersed in the milk. A container with milk for frothing must be held such that the rotating mixer is situated in the milk. The devices with frames are heavy, bulky, complex and expensive, and therefore not suitable in many situations. The necessary heating of the milk must always take place elsewhere in the case of the devices. Milk frothers can also be built into a coffee-maker, see for instance EP1440648 or EP1483998. WO2005089572 describes a milk frother comprising a frame consisting of a base with a heating element on which a container with milk for frothing has to be placed, and stirring means. It is possible herewith to heat the milk to a desired temperature, and subsequently mix and froth the milk, but this machine is also heavy, bulky, complex and expensive, and therefore less suitable in many situations. US2001/0036124 relates to a beverage container with integrated stirring device comprising a housing, a base and a lid. A stirring device is arranged in the base. The agitation element is situated in the vicinity of the bottom of the container and is driven 'from below'. EP1656866 describes a milk frother comprising a container, a housing, a drive system and a base plate. Heating means are built into the container and are powered together with the motor via the base plate. Here also the agitation element is situated in the vicinity of the bottom of the container and is driven 'from below'. If the agitation means are arranged in (the vicinity of the bottom of) the container, they are however difficult to clean. U.S. Pat. No. 4,480,926 describes a mixing cup comprising a container, a removable cover and a motor. The motor is arranged in the cover and is powered via a cord, which is attached to a handle, this handle in turn being mounted on the cover. The cord is however irksome during handling of the mixing cup and cleaning of the agitation

means, and the plug must first be removed from the wall socket in order to enable cleaning of the agitation means. In DE19645564 are described different embodiments of a mixing cup, wherein the agitation means can be driven by a motor placed in a cover or a base. The coupling between motor and agitation means can herein be of a magnetic or mechanical nature. In the case the motor is placed in the cover, and the agitation means are driven 'from above', a frame is necessary for this purpose. This once again makes the apparatus heavy, bulky, complex and expensive, and therefore less suitable in many situations.

[0003] There is therefore a need for a device for frothing milk which does not have the stated drawbacks in respect of weight, volume, complexity, cost price, appearance, production and use of prior art devices.

SUMMARY

[0004] In general, in one aspect, the invention provides methods and apparatus for frothing milk. The device includes a main body that forms a container for the milk, a cover fitting onto the main body, an agitator for frothing milk and a driver for driving the agitator. The driver is received at least partially in the cover. The driver is provided with a driver electric contact. The main body is provided with an upper main body electric contact and a first recess for receiving at least partially the driver. The first recess and the driver are shaped in such a way that electrical contact between the driver electric contact and the upper main body electric contact automatically is made when the cover is fitted on the main body and the first recess receives at least a part of the driver.

[0005] Various embodiments can include one or more of the following features and advantages. A base plate can be connected to the mains electricity in a home, and optionally for instance also to the electrical system in a vehicle. The base plate can be provided with a base plate electric contact and the main body can be provided with a lower main body electric contact, which makes electrical contact with the base plate electric contact when the main body is placed on the base plate and the main body can be provided with an electric conductor which forms an electrical connection between the lower main body electric contact and upper main body electric contact. The cover can for instance be placed loosely on the main body or be connected hingedly thereto. By providing the driver with electrical energy from the base plate by means of the electric conductor, it is possible to build the driver wholly or partially into the cover without a separate cord or a separate frame being necessary for the electric power supply thereto, this resulting in great advantages in respect of weight, volume, complexity, cost price, appearance, production and use of the device.

[0006] The driver can herein be connected mechanically in fixed manner to the cover or mechanically coupled in releasable manner to the cover. The driver can also be at least partially received in a recess provided for this purpose in the main body, being arranged for instance in a handle. The fact that the main body, the cover and the driver are releasable from each other makes cleaning of the device simpler. The at least partial accommodation of the driver in a recess in the main body makes a correct placing of the driver simpler and provides for support thereof. This will be further elucidated in the following description of exemplary embodiments of a device according to the invention.

[0007] The agitator is preferably coupled mechanically in releasable manner to the driver. Cleaning in this way becomes

even simpler, and the user can, if desired, then readily exchange the agitator for another type. The agitator preferably includes a substantially annular spiral spring. Such a spiral spring is found to suffice well in practice. The agitator can herein be placed out of centre in the container. This is found to result in a better mixing and frothing of the milk.

[0008] The device preferably also includes a heater, which is at least partially received in the main body. A separate heating plate or the like is then not necessary, and the heater is then also supplied with electric energy via the base plate. After release of the main body from the base plate the main body, the driver and the heater are no longer connected to the mains electricity or electrical system, and they can be moved freely relative to the base plate. This results in advantages in respect of safety and convenience of use.

[0009] The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Other features and advantages of the invention will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

[0010] FIG. 1A is a perspective view of a first exemplary embodiment of a device according to the invention.

[0011] FIG. 1B is a perspective, exploded view of the device in FIG. 1A.

[0012] FIG. 2A is a side view of a second exemplary embodiment of a device according to the invention.

[0013] FIG. 2B is a perspective, partially exploded view of the device in FIG. 2A.

[0014] Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

[0015] The devices (1,2) shown in the figures each comprise an agitator (3) and a driver (4) for driving thereof, in addition to a main body (5) which forms a container (15) for the milk and in which an electric conductor (not shown) is arranged. Main body (5) comprises a handle (6) serving to facilitate manipulation thereof. Each device (1,2) comprises a cover (7,8) fitting onto main body (5), which covers (7,8) are placed in the given examples loosely on main body (5), but which could also be for instance hingedly connected thereto. The driver (4) is provided with electrical energy by means of the electric conductor. For this purpose electrical contact is made between a base plate contact (also referred to as a first electric contact) (21) on base plate (12) and a lower main body contact (also referred to as a second electric contact) (22, not shown) on main body (5) and also between a driver contact (also referred to as a third electric contact) (14, not shown) on driver (4) and an upper main body contact (also referred to as a fourth electric contact) (13) on main body (5), in this case handle (6), wherein the electric conductor connects the lower main body electric contact (22) to the upper main body electric contact (13).

[0016] In the shown first exemplary embodiment (1), as shown in FIGS. 1A and 1B, driver (4) is received partly in a recess (9) provided for this purpose in cover (7) and also received partly in a recess (10) provided for this purpose in main body (5), in this case handle (6). Main body (5), cover (7) and driver (4) are mutually releasable, see FIG. 1b, which makes cleaning of device (1) simple. When reassembled, driver (4) is automatically positioned correctly. After reas-

sembly the driver (4) is supported by cover (7) and main body (5), in this case handle (6). No separate frame or separate cord is thus necessary to support driver (4) and/or for the electric power supply thereto. In the second exemplary embodiment (2), as shown in FIGS. 2A and 2B, the driver (4, not shown) is wholly received in cover (8) and connected fixedly thereto.

[0017] Agitator (3) includes an annular spiral spring (11) which is found to suffice well in practice. Agitator (3) is mechanically coupled in releasable manner to driver (4), whereby cleaning becomes simpler and the user can, if desired, easily exchange the agitator (3), in this case annular spiral spring (11), for a different type. Agitator (3) is placed out of the center of container (15), this being found to result in a better mixing and frothing of the milk.

[0018] Devices (1,2) also include a heater (not shown) with which the milk for frothing can be heated to a desired temperature in container (15). The heater is received in main body (5) so that a separate heating plate or the like is not necessary. The heater is also supplied with electrical energy via the base plate contact (21) in base plate (12). After removal of main body (5) from base plate (12), main body (5), driver (4), cover (8) and the heater are no longer connected to the mains electricity and can be moved freely relative to base plate (12). This results in advantages in respect of safety and convenience of use.

[0019] It will be apparent to those of ordinary skill in the art that the invention is by no means limited to the given exemplary embodiments, but that many variants are possible within the scope of the invention. For example, devices according to various embodiments of the invention can also be used to heat and/or stir and/or froth beverages other than milk. Accordingly, other embodiments are within the scope of the following claims.

1. A device for frothing milk, comprising:

a main body, which main body forms a container for the milk;

a cover fitting onto the main body; and

an agitator for frothing milk and a driver for driving the agitator, wherein:

the driver is received at least partially in the cover,

the driver is provided with a driver electric contact,

the main body is provided with an upper main body electric contact and a first recess for receiving at least partially the driver, and

the first recess and the driver are shaped in such a way that electrical contact between the driver electric contact and the upper main body electric contact automatically is made when the cover is fitted on the main body and the first recess receives at least a part of the driver.

2. The device of claim 1, wherein the main body comprises a handle and the first recess is arranged at least partially in the handle

3. The device of claim 1, wherein:

the device further comprises a base plate provided with a base plate electric contact, where the base plate is mechanically coupled in a releasable manner to the main body;

the main body is provided with a lower main body electric contact, which lower main body electric contact makes electrical contact with the base plate electric contact when the main body is placed on the base plate; and

the main body is provided with an electric conductor, which electric conductor forms an electrical connection

between the lower main body electric contact and the upper main body electric contact.

4. The device of claim 1, wherein the driver is received at least partially in the cover in a second recess.

5. The device of claim 1, wherein the driver has an end for engaging with the first recess, and the end is shaped to fit into at least a part of the first recess.

6. The device of claim 1, wherein the driver is connected mechanically in a fixed manner to the cover.

7. The device of claim 1, wherein the driver is mechanically coupled in a releasable manner to the cover.

8. The device of claim 1, wherein the agitator is mechanically coupled in a releasable manner to the driver.

9. The device of claim 1, wherein the agitator comprises a substantially annular spiral spring.

10. The device of claim 1, wherein the agitator is placed out of center in the container.

11. The device of claim 1, wherein the agitator is placed out of center towards the driver electrical contact.

12. The device of claim 1, further comprising a heater, which heater is at least partially received in the main body.

13. The device of claim 3, further comprising a heater, which heater is at least partially received in the main body, wherein the heater makes electrical contact with the base plate electric contact via the lower main body electric contact when the main body is placed on the base plate.

14. The device of claim 1, wherein the cover is placed loosely on the main body or is connected hingedly to the main body.

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