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Stand mixer

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Abstract

A stand mixer is described which includes a stand assembly including a base and a support extending from the base; a mixing head carried on the support, the mixing head adapted to receive one or more mixing attachments, the mixing, in use, being driven by a motor; a turntable assembly rotatably mounted to the base to allow the turntable assembly to freely rotate; a mounting arrangement for releasably securing a mixing bowl to turntable assembly; and a locking assembly having a locked configuration in which rotation of the turntable assembly is prevented, and a released configuration in which the turntable can freely rotate.

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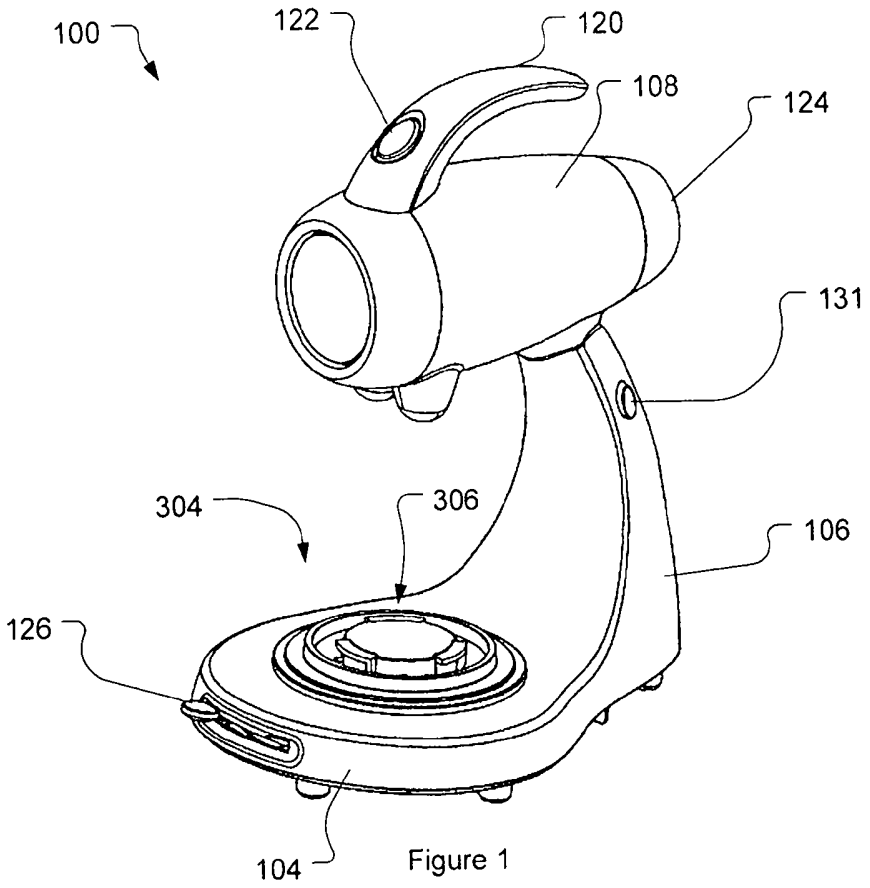

Figure 1

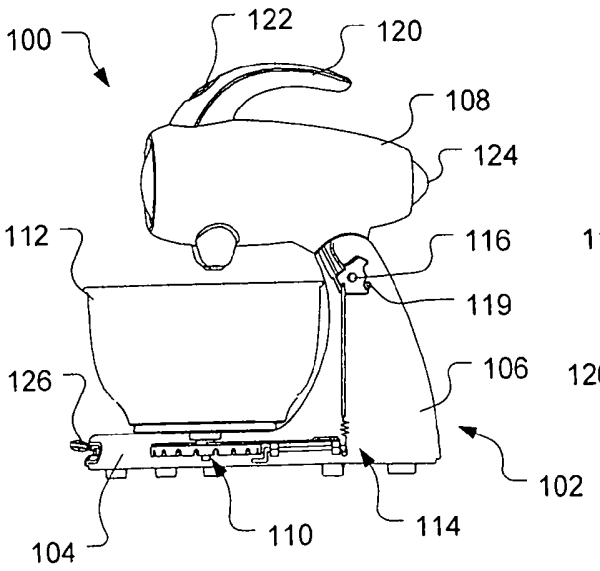

Figure 2

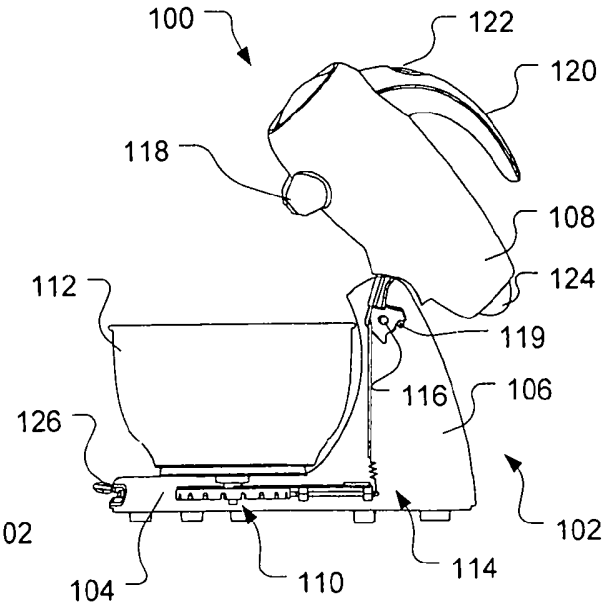

Figure 3

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COMPLETE SPECIFICATION
STANDARD PATENT

Invention Title: **Stand mixer**

The following statement is a full description of this invention, including the best method of performing it known to us:

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Stand mixer

Field of the invention

The present invention relates to stand mixers, and in particular stand mixers for domestic use.

Background of the invention

Stand mixers are common domestic kitchen appliances.

Examples of stand mixers are single attachment mixers, dual attachment mixers, and planetary mixers.

Stand mixers typically include a stand which supports both a bowl and a mixing head. The bowl receives ingredients to be mixed, and the mixing head includes (or receives) mixing attachments which in use extend into the bowl and are rotated to mix the contents of the bowl.

It would be desirable to provide the public with the choice of a new and useful food mixer.

Summary of the invention

In one aspect the present invention provides a stand mixer, including: a stand assembly including a base and a support extending from the base; a mixing head carried on the support, the mixing head adapted to receive one or more mixing attachments, the mixing, in use, being driven by a motor; a turntable assembly rotatably mounted to the base to allow the turntable assembly to freely rotate; a mounting arrangement for releasably securing a mixing bowl to turntable assembly; and a locking assembly having a locked configuration in which rotation of the turntable assembly is prevented, and a released configuration in which the turntable can freely rotate.

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In a second aspect the present invention provides a stand for a mixer, the stand including: a base; a support extending from the base and adapted to receive a mixing head; a turntable assembly rotatably mounted to the base to allow the turntable assembly to freely rotate; a mounting arrangement for releasably securing a mixing bowl to turntable assembly; and a locking assembly having a locked configuration in which rotation of the turntable assembly is prevented, and a released configuration in which the turntable can freely rotate.

The mixing head may pivotably attach to the stand, the mixing head being pivotable between a mixing position in which the one or more mixing attachments extend, in use, into a mixing bowl secured to the turntable assembly, and a clearance position in which the one or more mixing attachments are lifted clear of the mixing bowl secured to the turntable assembly.

When the mixing head is in the clearance position the locking assembly may be in the locked configuration, preventing rotation of the turntable assembly. When the mixing head is in the mixing position the locking assembly may be in the released configuration, allowing rotation of the turntable assembly.

The locking assembly may be switchable between the locked and released configurations by a user control.

The turntable assembly may include an engagement means for engaging with the locking assembly when the locking assembly is in the locked configuration.

The locking assembly may include a locking element, said locking element adapted to engage with the engagement means when the locking assembly is in the locked configuration.

The locking element and the engagement means may be complementarily shaped such that when the locking assembly is in the locked configuration the locking element physically engages with the engagement means.

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The engagement means may include a disc which rotates with the turntable assembly, the disc including at least one notch, and the locking element may include a bar which engages with said at least one notch when in the locked configuration.

The mounting arrangement may be a rotational mounting arrangement.

The mounting arrangement may be a bayonet mounting arrangement.

The head unit may be releasably received on said support.

In one embodiment, the turntable assembly is not driven by a motor.

As used herein, except where the context requires otherwise, the term "comprise" and variations of the term, such as "comprising", "comprises" and "comprised", are not intended to exclude further additives, components, integers or steps.

Brief description of the drawings / figures

An embodiment of the invention will be described with reference to the following figures in which:

Figure 1 is a perspective view of a stand mixer in accordance with an embodiment of the invention, the mixing head being depicted in a mixing position;

Figure 2 is a cut-away side view of the stand mixer of Figure 1, the mixing head being depicted in a mixing position;

Figure 3 is a cut-away side view of the mixer of Figure 1 with the mixing head in a clearance position;

Figure 4 is a side view of the turntable and locking assemblies of the mixer of figure 1, the locking assembly being in an released configuration;

Figure 5 is a side view of the turntable and locking assemblies of the mixer of figure 1, the locking assembly being in a locked configuration;

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Figure 6 is a rear view of the mixer of Figure 1 with the mixing head in a mixing position; and

Figure 7 is bottom view of the mixer of figure 1.

Detailed description of the embodiments

Figures 1 to 3 provide a perspective and two side views of a stand mixer 100 in accordance with an embodiment of the invention. In Figures 2 and 3 the casing 102 of the mixer 100 is transparent to allow various components of the mixer to be seen. It will be appreciated that not all components of the mixer are shown, with many standard parts (e.g. the motor and drive train) being omitted for the sake of clarity.

In the embodiment depicted, mixer 100 is generally C-shaped (in side view). Mixer 100 includes a generally L-shaped (in side view) stand assembly 102, which includes a base 104 and a support 106. A mixer head unit 108 is mounted on the support 106.

The base 104 supports the support 106 and in this embodiment is integral therewith. The base 104 also includes a turntable assembly 110 which receives a mixing bowl 112, and turntable locking assembly 114 for selectively preventing and allowing rotation of the turntable assembly 110. The turntable and turntable locking assemblies 110 and 114 will be discussed in further detail below.

The mixer head unit 108 is pivotally attached to the support 106 via a pin 116 about which the mixer head unit 108 can pivot relative to the support 106. When the mixer head 108 is pivoted, a plate assembly 117 also pivots. As shown in Figure 6, plate assembly 117 includes an upper stop 119, a lower stop 121, and an intermediate stops 12. An upper recess 125 is formed between the upper stop 119 and the intermediate stop 123 and, similarly, a lower recess 127 is formed between the lower stop 121 and the intermediate stop 123. As discussed below, the upper and lower stops 119 and 121 act against a head unit locking pin 129 to limit the pivotal range of movement of the head unit 108, and to secure the head unit 108 in either the mixing or clearance position. The mixer head unit 108 includes outlets 118 (in this instance two) which are adapted to releasably receive a variety of mixing attachments (also not shown) such as

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beaters, hooks, whisks etc. During operation, the mixing attachments are driven by the motor (not shown) to mix or otherwise process ingredients placed in the bowl 112. The motor is housed in either the head unit 108 or the support 106 of the casing 102 and may, for example, be an electric motor. The motor is operatively connected to the outlet(s) 118 to rotate any mixing attachment received therein. In planetary mixers, the motor may also rotate the outlets 118 themselves to perform a planetary or dual beater mixing action with the attachments.

The mixer 100 also includes a handle 120 which allows a user to easily pivot the mixing head 108 between a mixing position and a clearance position. The handle 120 carries a button 122 which when depressed by a user ejects any beating attachments that may be secured in the outlets 118.

In the mixing position (as shown in Figure 1) the mixer head unit 108 is generally parallel to the base 104 and the outlets 118 are positioned above the turntable assembly 110. In use, when the head unit 108 is in the mixing position the mixing attachments extend into the bowl 112 supported by the turntable assembly 110 to allow for the mixing/processing of ingredients in the bowl. In the clearance position (as shown in Figure 2) the mixer head unit 108 (and any attachments received in the outlets 118) is lifted clear of the bowl 112, allowing a user to easily access the bowl 112 and outlets 118 to remove or change the mixing attachments. The clearance position also allows a user easy access to detach and remove the bowl 112 from the turntable assembly 110.

The head unit 108 is held stably in position in the mixing and clearance positions by interaction between the plate assembly 117 and the head unit locking pin 129. As can be seen, locking pin 129 has relatively small diameter section and a relatively large diameter section. To lock the head unit 108 in place, the locking pin 129 is positioned such that the relatively larger diameter section is positioned in either the upper recess 125 (to secure the head unit 108 in the clearance position) or in the lower recess 127 (to secure the head unit in the mixing position, as is depicted in Figure 6). The diameter of the larger diameter section of the pin 129 is such that the intermediate stop 123 bears against the pin 129 and prevents pivotal movement of the head unit 108. Conversely, in order to move the head unit 108 between the mixing and clearance positions (or vice

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versa), the pin 129 is slid such that the smaller diameter section lies in the upper/lower recess 125/127. The diameter of the smaller diameter section is such that the intermediate stop 123 is not obstructed by the pin 129, allowing the head unit 108 to pivot. Typically the locking pin 129 will be spring loaded such that the pin is biased to a locking position – i.e. with the larger diameter section occupying the upper or lower recess 123/125. The bias of the spring is overcome by a user operable button 131 or similar which, when pressed by a user, urges the locking pin 129 against the bias of the spring, sliding the larger diameter section of the pin 129 out of the upper or lower recess 123/125 and thereby allowing the head unit 108 to pivot.

Mixer 100 also includes a control 124 (in this instance a rotary control) which allows a user to operate the mixer 100 by turning the mixer on and off and setting the speed of the motor (and, consequently, the speed at which mixing attachments received in the mixing outlets 118 are driven).

The mixer 100 is also provided with a lever 126 which, when operated by a user, pivots/slides the turntable assembly 110 between a large bowl receiving position and a small bowl receiving position.

Turning to Figures 3 to 7, the turntable assembly 110 and turntable locking assembly 114 will be described.

The turntable assembly 110 includes an axle 302 which is rotatably secured via a bearing 303 or similar (in this particular instance a brass bush) in the housing 102. The axle is able to freely rotate relative to the housing. The upper end of the axle is fitted with a bowl receiving assembly 304 which rotates with the axle 302. The bowl receiving assembly 304 includes a bowl locking assembly 306. The bowl locking assembly 306 allows a mixing bowl (such as bowl 112) to be releasably secured or attached to the bowl receiving assembly 304. In this instance the bowl locking assembly 308 is a bayonet type fitting which engages with appropriate formations on a mixing bowl, though alternative locking assemblies are of course possible.

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The lower end of the axle 302 is fitted with an engagement assembly 310. The engagement assembly 310 also rotates with axle 302 and, as discussed below, engages with the turntable locking assembly 114 to prevent rotation of the axle 302 (and bowl receiving assembly 304 and any bowl secured thereto) when the turntable locking assembly 114 is in a locked configuration. In the present embodiment the engagement assembly 310 includes a disc 312 having an annular wall 314 depending from its periphery. The wall 314 is formed with a plurality of slots 316 shaped to receive a locking member of the turntable locking assembly 114.

In alternative embodiments, instead of being provided as a separate component, the engagement assembly 310 could be formed integrally with the bowl receiving assembly 304. For example the bottom of the bowl receiving assembly 304 could itself be provided with a slot/notch such as 316 (or other suitable formation) for engagement by the locking assembly 114.

In use, a mixing bowl such as bowl 112 is securely attached to the turntable assembly 110. The mixing action of the mixing attachment(s) is such that the bowl 112 and turntable assembly 110 rotate during mixing. As noted above, this is a "free" rotation of the bowl 112/turntable assembly 110. This is in contrast to some known mixers which include a turntable assembly that is rotated by a motor (either the same motor that drives the mixing attachments, or a dedicated turntable motor). By avoiding the need for a second motor, or complex connection assemblies joining the mixing motor to the turntable, the construction of the stand mixer is simplified.

The locking assembly 114 of the present embodiment includes a locking element 402 which is moveable between a released position (shown in Figures 4 and 6) and a locked position (shown in Figures 5 and 7). Locking element 402 includes a locking section 404 (which, when in a locked position, engages with the engagement assembly 310 of the turntable assembly 110), a first connection section section 406 substantially orthogonal to the locking section 404, an extension section 408 which is substantially orthogonal to the first connection section 406 and substantially parallel to the locking section 404, and a second connection section 410 which is orthogonal to both the first connection section 406 and the extension section 408. The extension section 408 is

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rotatably received in two housings 412 and 414 which hold the locking element 402 in place and allow it to rotate about an axis defined by the extension section 408.

The locking element 402 (in particular the connection section 410) is connected to a spring 416 which is in turn connected to a linkage 418, which is in turn connected to the plate assembly 117. Linkage 418 may be provided as a rigid bar, however alternatives (e.g. wire or cable) linkages are of course possible.

As noted above, when the head unit 108 moves between the mixing and clearance configuration the plate assembly 117 also moves. The connection between the plate assembly 117 and the linkage 418 is such that when the head unit 108 is lifted, the plate assembly 117 pulls the linkage 418 upwards. This causes rotation of the locking element 402 about the extension section 408, which in turn causes the locking section 404 of the locking element 402 to engage with one of the slots 316 in the engagement assembly 310 of the turntable assembly 110. This can be seen in Figures 5 and 7. In this configuration the locking assembly 114 is said to be in the locked configuration (and the locking element 404 in the lock position).

In the present embodiment, the spring 416 provides some play in the locking assembly 114. In the case that the head unit 108 is pivoted to the clearance position and the locking element 402 is not aligned with a slot 316, the locking element 402 will rest against the wall 314, with the spring urging the locking element 402 upward. If a user then rotates the turntable assembly 110 (e.g. by attempting to attach/release a mixing bowl), the rotation will serve to align one of the slots 316 with the locking element 402 at which point the spring will act to drop the locking element 402 into place in the notch. Alternative arrangements to this are, of course possible. By way of example, slots 316 could be provided with flared edges to encourage the locking element 402 to always locate in a notch 316.

In the locked configuration, the locking assembly 110 prevents the engagement assembly 310 to from rotating which, in turn, prevents the axle 302 and bowl receiving assembly 304 from rotating. This is advantageous as it allows a user to secure a mixing bowl to the bowl receiving assembly 304 without the process being exacerbated by

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rotation of the bowl receiving assembly 304. As will be appreciated, this is particularly useful where the securement of a mixing bowl to the bowl receiving assembly 304 is by a rotationally dependent means (such as the bayonet fitting of the illustrated embodiment).

As can be seen in Figures 4 and 6, when the head unit 108 is pivoted to the mixing position, the corresponding rotation of plate assembly 117 lowers the linkage 418. This causes the locking element 402 to rotate about the extension section 408 (in the opposite direction to when the head unit 108 is lifted), thereby removing the lock section 404 from the slot 316 in the engagement assembly 310. In this configuration the locking assembly 114 is said to be in the released configuration (and the locking element 404 in the released position). In the released configuration the locking assembly 110 does not interfere with the turntable assembly 110 which can, absent any other interference, rotate freely.

In the embodiment described above, the configuration of the locking assembly 114 is changed automatically by pivoting the head unit 108 between the mixing position (in which the locking assembly 114 is in the released configuration, allowing the turntable assembly 110 to rotate during mixing) and the clearance position (in which the locking assembly 114 is in the locked configuration, preventing rotation of the turntable assembly 114 and allowing a user to attach/remove a mixing bowl therefrom). Alternative embodiments are, of course, possible.

For example, instead of being connected to the plate assembly 117, linkage 418 could be connected directly to a dedicated turntable lock/release dial or similar user control. In this instance the locking assembly 114 would not automatically lock/release the turntable assembly 110 on pivoting of the head unit 108, but instead a user could select whether to allow or prevent rotation of the turntable assembly 110 independently of the position of the head unit 108. This may be useful, for example, where allowing free rotation of the bowl when the head unit 108 is in the clearance position is desirable – for example to allow a user to easily add ingredients to the bowl.

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By way of further example, the locking element 402 could be activated by an electric solenoid or other electromechanical device. Such a device could be triggered on movement of the head unit 108 between the mixing and clearance positions or by a user control.

Further alternative embodiments of the invention are, of course, possible. For example, in the embodiment described above and illustrated, the mixer 100 is shown as an integral unit (i.e. the head unit 108 being permanently attached to the support 106 and base 104). It is, however, possible to provide a stand assembly (including a base and support) which receives a portable hand mixer (i.e. a mixing unit that can either be hand-held by an operator or can be releasably mounted to the stand assembly to allow hands-free operation). With reference to such a mixer, an embodiment of the invention extends to a stand assembly which is adapted to releasably receive a mixing head unit. As will be appreciated, in such an embodiment the support 106 and base 104 of the mixer 100 described above can largely be retained, the only potential modification being the attachment point of the linkage 418 (which would either need to be attached to a dedicated dial or similar as described above, or to the appropriate component in the means by which the mixing head is removably attached).

It will be understood that the invention disclosed and defined in this specification extends to all alternative combinations of two or more of the individual features mentioned or evident from the text or drawings. All of these different combinations constitute various alternative aspects of the invention.

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The claims defining the invention are as follows:

1. A stand mixer, including:

a stand assembly including a base and a support extending from the base;

a mixing head carried on the support, the mixing head adapted to receive one or more mixing attachments, the mixing, in use, being driven by a motor;

a turntable assembly rotatably mounted to the base to allow the turntable assembly to freely rotate;

a mounting arrangement for releasably securing a mixing bowl to turntable assembly; and

a locking assembly having a locked configuration in which rotation of the turntable assembly is prevented, and a released configuration in which the turntable can freely rotate.

2. A stand mixer according to claim 1, wherein the mixing head is pivotably attached to the stand, the mixing head being pivotable between a mixing position in which the one or more mixing attachments extend, in use, into a mixing bowl secured to the turntable assembly, and a clearance position in which the one or more mixing attachments are lifted clear of the mixing bowl secured to the turntable assembly, and wherein

when the mixing head is in the clearance position the locking assembly is in the locked configuration, preventing rotation of the turntable assembly; and

when the mixing head is in the mixing position the locking assembly is in the released configuration, allowing rotation of the turntable assembly.

3. A stand mixer according to claim 1, wherein the locking assembly is switchable between the locked and released configurations by a user control.

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4. A stand mixer according to any one of claims 1 to 3, wherein the turntable assembly includes an engagement means for engaging with the locking assembly when the locking assembly is in the locked configuration.

5. A stand mixer according to claim 4, wherein the locking assembly includes a locking element, said locking element adapted to engage with the engagement means when the locking assembly is in the locked configuration.

6. A stand mixer according to claim 5, wherein the locking element and the engagement means are complementarily shaped such that when the locking assembly is in the locked configuration the locking element physically engages with the engagement means.

7. A stand mixer according to claim 5 or claim 6, wherein the engagement means includes a disc which rotates with the turntable assembly, the disc including at least one notch, and wherein the locking element includes a bar which engages with said at least one notch when in the locked configuration.

8. A stand mixer according to any one of claims 1 to 7, wherein the mounting arrangement is a rotational mounting arrangement.

9. A stand mixer according to any one of claims 1 to 8, wherein the head unit is releasably received on said support.

10. A stand mixer according to any one of claims 1 to 9, wherein the turntable assembly is not driven by a motor.

11. A stand for a mixer, the stand including:

a base;

a support extending from the base and adapted to receive a mixing head;

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a turntable assembly rotatably mounted to the base to allow the turntable assembly to freely rotate;

a mounting arrangement for releasably securing a mixing bowl to turntable assembly; and

a locking assembly having a locked configuration in which rotation of the turntable assembly is prevented, and a released configuration in which the turntable can freely rotate.

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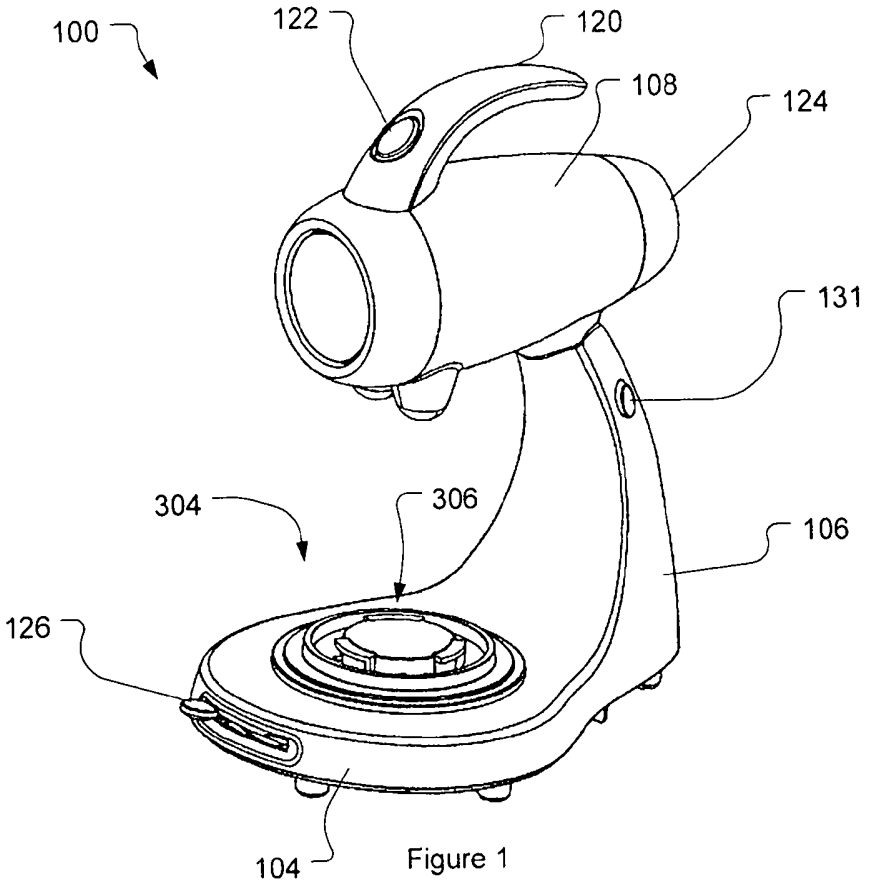

Figure 1

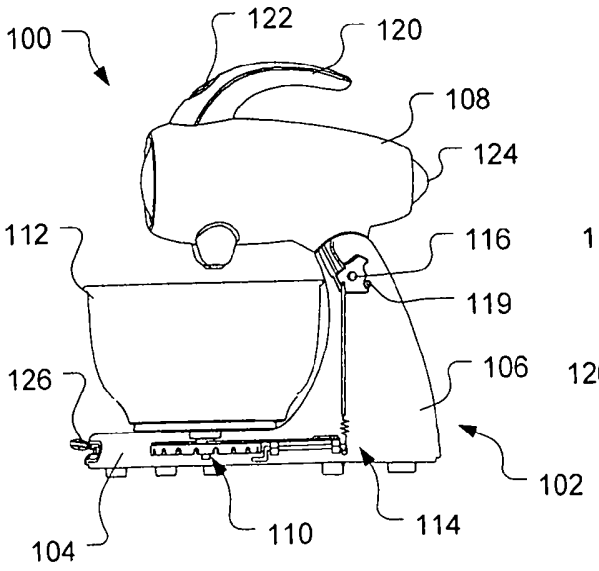

Figure 2

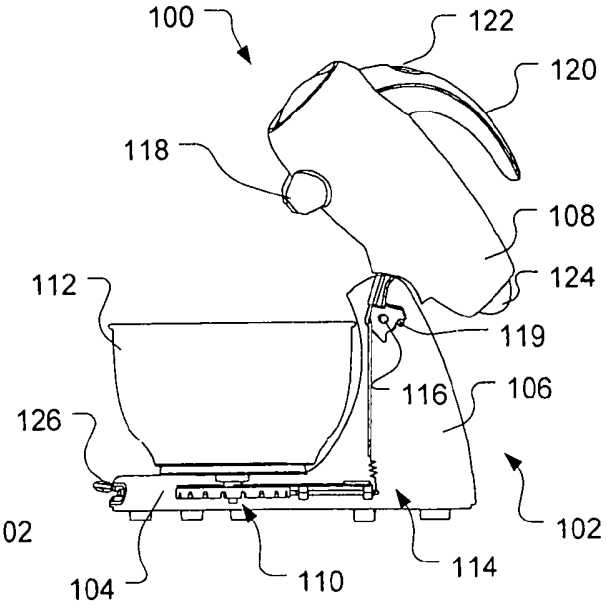

Figure 3

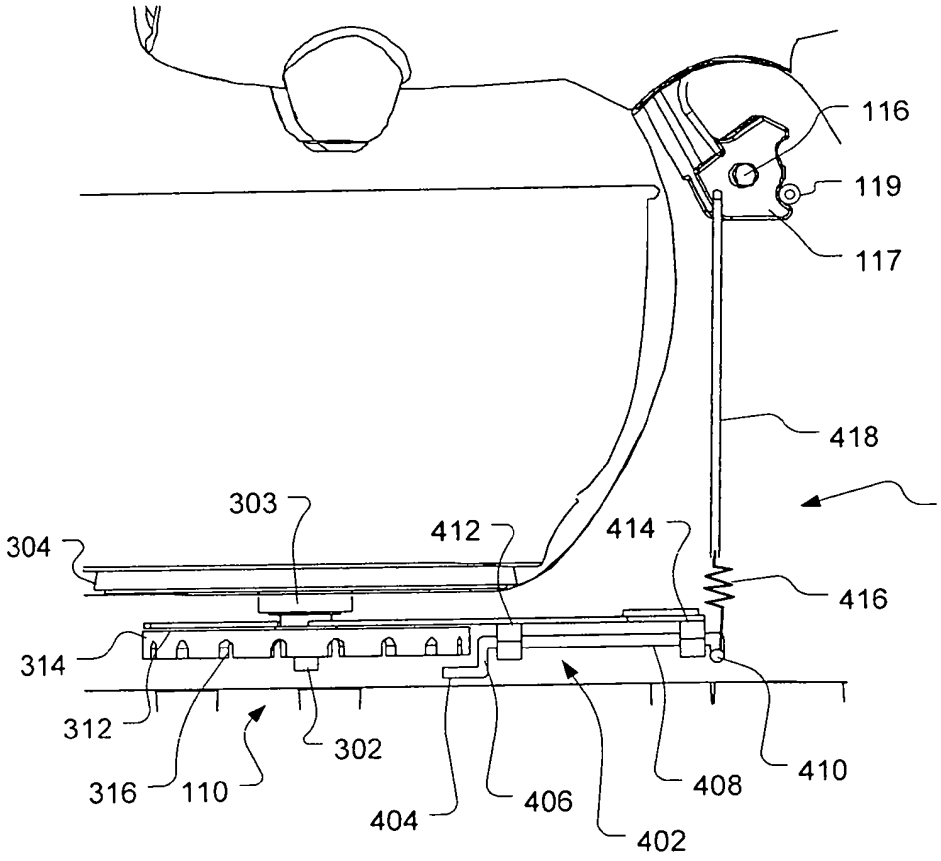

Figure 4

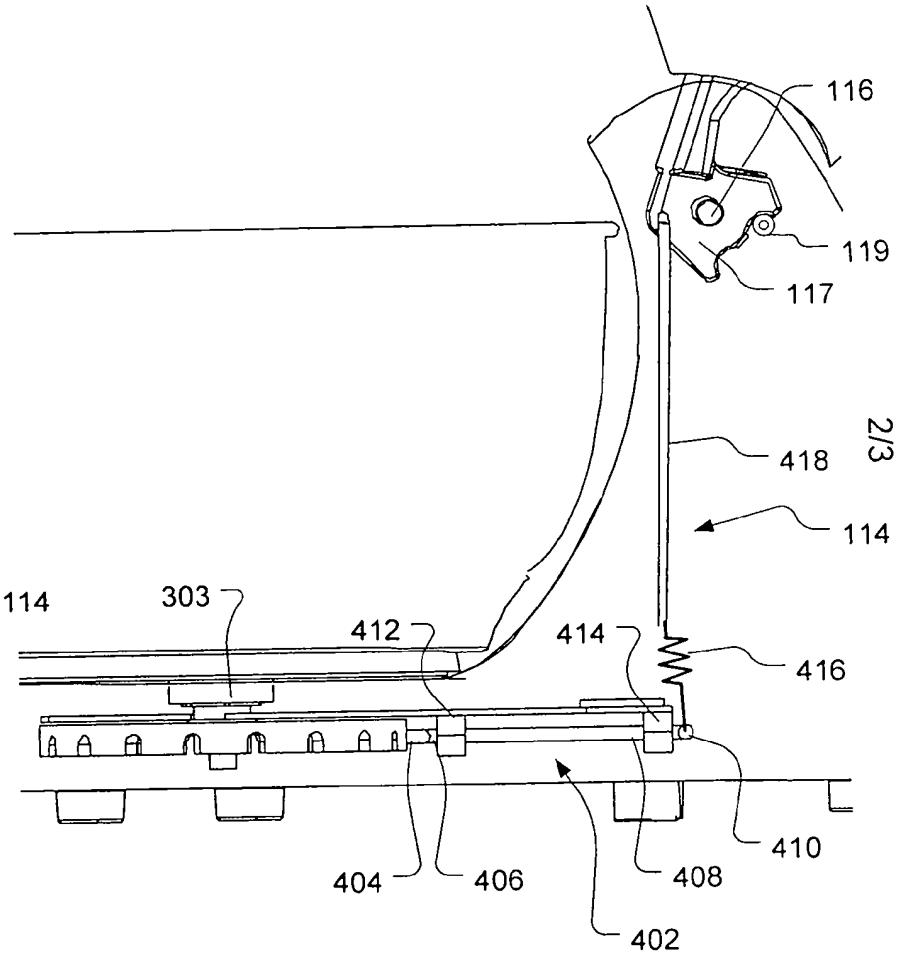

Figure 5

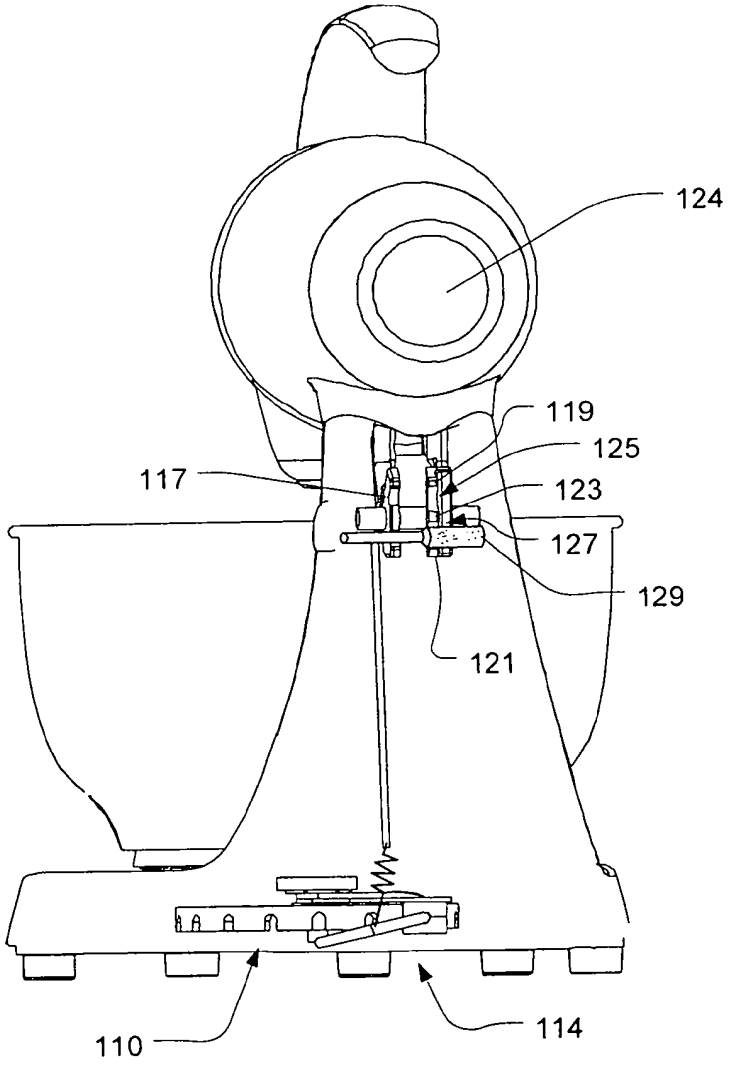

Figure 6

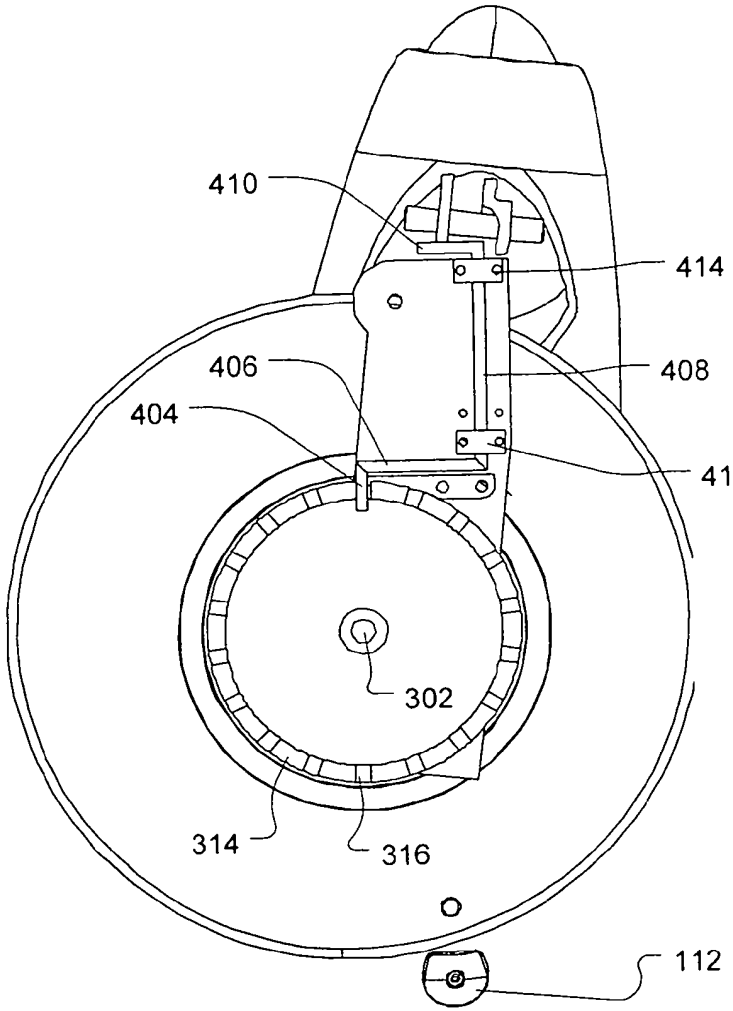

Figure 7