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(71) Applicant(s):
Ben Remiszewski
Roabela, Stoke Road, Bishops Cleeve, CHELTENHAM, GL52 8XT, United Kingdom

(72) Inventor(s):
Ben Remiszewski

(74) Agent and/or Address for Service:
Chapman Molony
Cardiff Business Technology Centre, Senghennydd Road, Cathays, CARDIFF, CF24 4AY, United Kingdom

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(58) Field of Search:
INT CL **A47J, B01L**
Other: **WPI and EPODOC**

(54) Title of the Invention: **Mixing device**
Abstract Title: **A mixing device**

(57) A mixing device 10 comprises a dispenser 13 for dispensing material into a receptacle 12, a mixing arm 19 which extends from the dispenser 13 and which is arranged to extend into a fluid 22, and drive means for causing the arras 19 to rotate to mix the fluid wherein the dispenser 13 is arranged to dispense material into the receptacle in dependence of the rotation of the mixing arm. Ideally, the dispenser 13 comprises a housing 15 with a first aperture 17 disposed at an upper region for receiving material into the housing and a second aperture disposed at a lower region of the housing for feeding material into the receptacle. The housing of the dispenser may further contain an agitation means, such as a blade, which is coupled to the drive means of the mixing arm for mixing material contained in the dispenser. The mixing arm may comprise a mixing blade or whisk. The device may further comprise temperature sensors and heating means. The device can be used in the preparation of food and forms part of the lid of a saucepan or cooking pot.

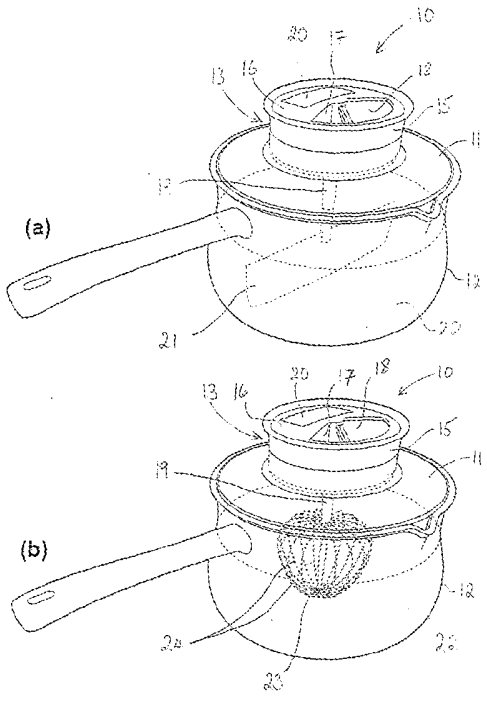
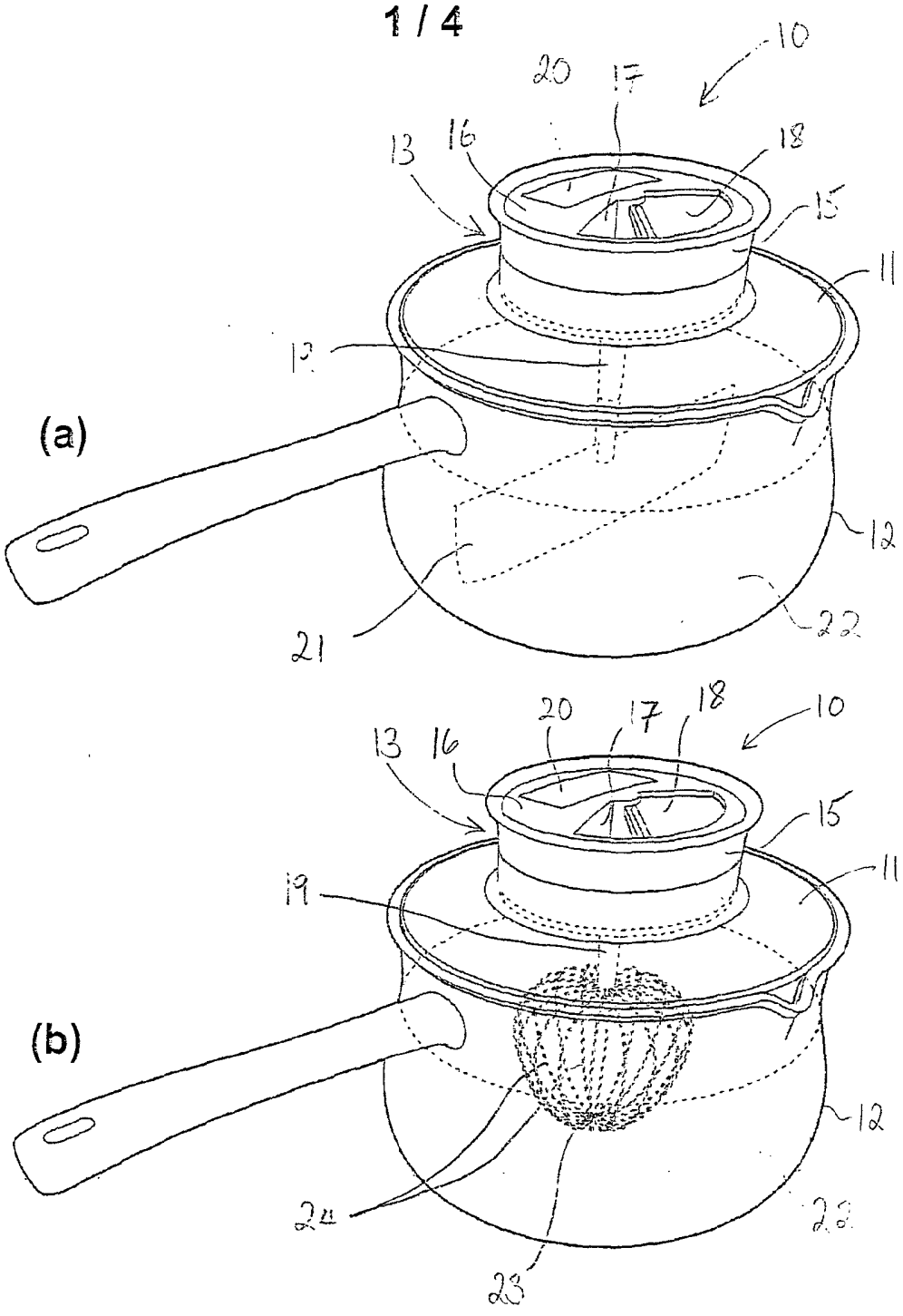


Figure 1

GB 2479205 A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(b)
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Figure 1

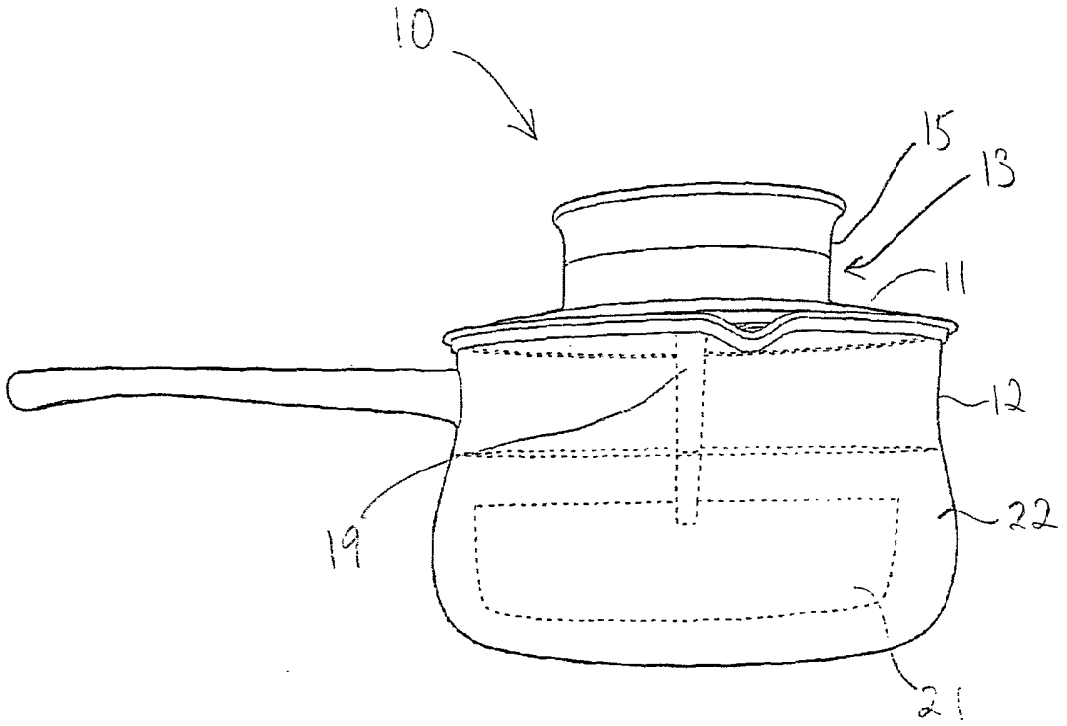

Figure 2

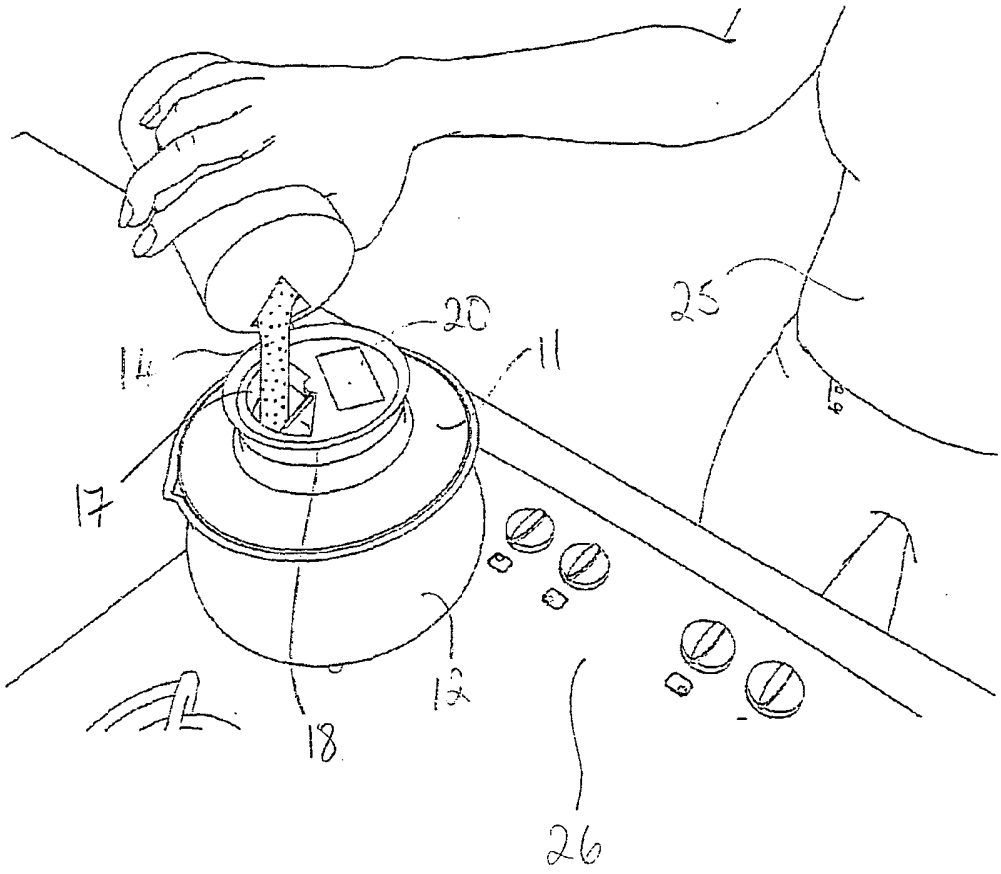

Figure 3

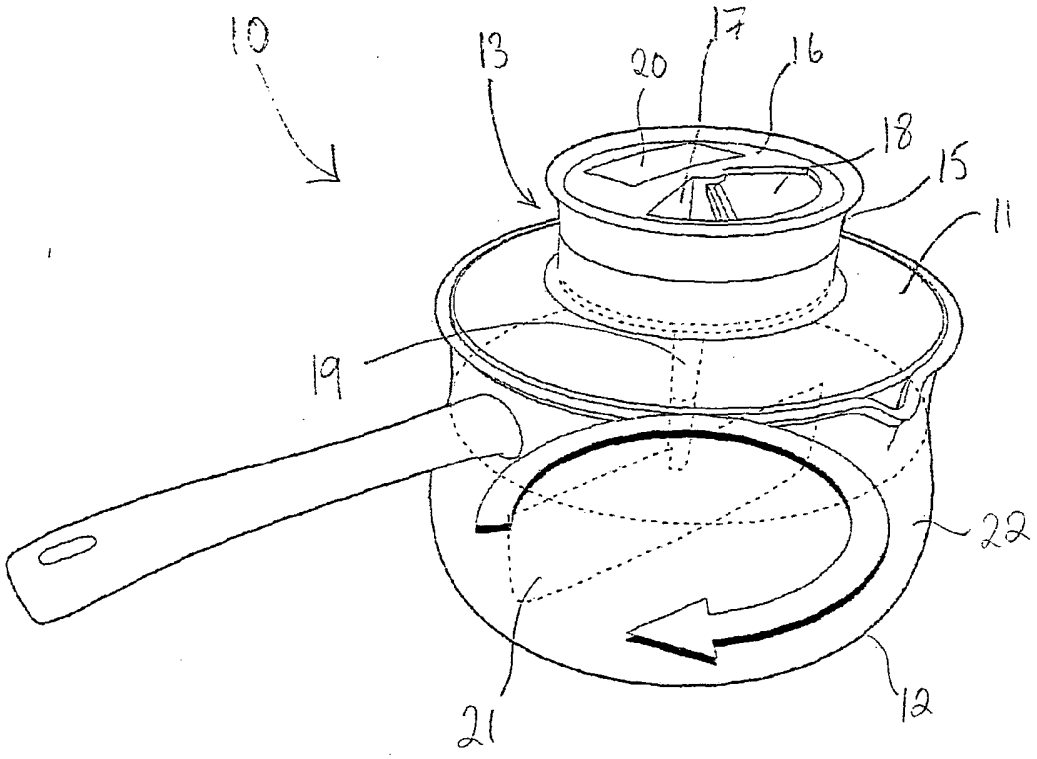

Figure 4

MIXING DEVICE

The present invention relates to a mixing device and particularly, but not exclusively, to a mixing device for the preparation of a fluid food product within a receptacle.

When making a fluid food product such as gravy or custard, it is necessary to add a dry food product such as powder or granules to water, for example. It is necessary to add the dry food product gradually to the water, while continuously stirring the fluid to minimise the formation of lumps of dry food product within the resulting fluid. This can be a difficult task to perform when it is also necessary to supervise and attend to other food products as they are being prepared.

I have now devised a mixing device which alleviates the above mentioned problem.

In accordance with the present invention as seen from the first aspect, there is provided a mixing device for the preparation of a fluid product within a receptacle, the device comprising a dispenser for dispensing material into the receptacle, a mixing arm which extends from the dispenser and which is arranged to extend into the fluid, and drive means for causing the arm to rotate to mix the fluid,

wherein the dispenser is arranged to dispense material into the receptacle in dependence of the rotation of the mixing arm.

The mixing device thus enables the preparation of a fluid food product such as gravy or custard with minimal supervision and without requiring the user to continuously stir the fluid as the dry food product is added thereto.

The dispenser preferably comprises a housing comprising a first aperture disposed at an upper region thereof for receiving the material into the housing and a second aperture disposed at the lower region thereof through which the material can pass from the housing into the receptacle.

Preferably, the first and second apertures comprise respective closures which are movable between a first position in which the aperture is substantially closed, and a second position in which the aperture is substantially open.

The mixing device further comprises sensing means for sensing the temperature of the fluid within the receptacle. The closure of the second aperture is preferably

movable between the first and second positions in dependence of the sensed temperature.

Preferably, the drive means is disposed within the housing and is coupled with a proximal end of the mixing arm. A distal end of the mixing arm is preferably coupled to a mixing blade or whisk arrangement or similar.

The dispenser further comprises agitation means for agitating the material within the housing in dependence of the rotation of the mixing arm. The agitation means preferably comprises a blade which is coupled to the drive means and which is arranged to cause material disposed within the housing, to pass out from the housing through the second aperture.

Preferably, the blade is arranged to rotate within the housing.

The mixing device preferably further comprises heating means for heating the fluid within the receptacle.

The mixing device is preferably formed as part of a lid of the receptacle.

In accordance with the present invention as seen from the second aspect there is provided a receptacle which is arranged to hold a fluid, the receptacle comprising a mixing device according to the first aspect.

Preferably, the receptacle comprises a saucepan.

Embodiments of the present invention will now be described by way of example only and with reference of the accompanying drawings in which:

Figure 1a is a respective view of a mixing device according to a first embodiment of the present invention, disposed within a lid of a saucepan;

Figure 1b is a perspective view of the mixing device according to a second embodiment of the present invention, disposed within a lid of a saucepan;

Figure 2 is a side view of the mixing device illustrated in figure 1a;

Figure 3 is a schematic illustration of the introduction of a dry food product into the mixing device; and,

Figure 4 is a perspective view of the mixing device illustrated in fig.1a, during use.

Referring to figures 1 and 2 drawings there is illustrated a mixing device 10 which is used in the preparation of fluid a food product such as gravy or custard. In the embodiments illustrated in the drawings, the mixing device 10 is formed as part of the lid 11 of a receptacle, such as saucepan 12, however, it is to be appreciated that the mixing device 10 is easily adapted to suit any receptacle.

The mixing device 10 comprises a dispenser 13 which is arranged to extend above the receptacle 12 in which the fluid food product is to be prepared and is arranged to hold the material 14 to be dispensed into the receptacle 12 such as a powder or granules. The dispenser 13 comprises a substantially cylindrical housing 15 which extends substantially upwardly away from the lid 11. The upper region of the dispenser 13 comprises a cover 16 having a first aperture 17 disposed therein which is closable by a hand operated closure 18. The closure 18 is slidable between a first position in which the closure 18 substantially closes the aperture 17 and a second position in which the closure 18 is removed from the aperture 17 to substantially open the aperture 17.

The dispenser 13 further comprises a mixing arm 19 which is arranged to extend from within the receptacle 12 to a position disposed within the housing 15 of the dispenser 13, and comprises a longitudinal axis which is arranged to extend substantially centrally of the receptacle 12. The proximal end of the mixing arm 19, namely the portion of the mixing arm 19 disposed within the housing 15, is arranged to couple with a drive unit (not shown), which is disposed within a separate chamber 20 within the housing 15. The proximal end of the mixing arm 19 is further coupled with a mixing blade (not shown) which extends from the proximal end of the mixing arm 19 in a direction which is substantially radially of the housing 15. The mixing blade (not shown) is arranged to extend substantially along the length of the housing

15 and is arranged to rotate within the housing 15 about the longitudinal axis, as the drive unit (not shown) causes the mixing arm 19 to rotate about the longitudinal axis.

The housing 15 further comprises a second aperture (not shown) disposed therein at a lower region thereof, which is closable via a second closure (not shown). The second aperture (not shown) may comprise a perforated cover or grate (not shown) which extends across the second aperture (not shown), such that as the mixing blade (not shown) rotates within the housing 15 the material 14 disposed therein is caused to pass out from the housing 15 through the second aperture (not shown) and become sprinkled into the receptacle 12 by virtue of the perforated cover or grate (not shown).

Referring to figure 1a of the drawings there is illustrated a mixing device 10 according to a first embodiment of the present invention. The distal end of the mixing arm 19 of the first embodiment, namely the portion of the mixing arm 19 which is arranged to extend within the receptacle 12, is coupled to a central portion of a mixing blade 21. The mixing blade 21 is arranged to extend in a substantially vertical plane and is arranged to extend along a diameter of the receptacle 12. Accordingly, as the mixing arm 19 rotates, the mixing blade 21 is caused to rotate within the receptacle 12 to stir the fluid food product 22 being prepared and thus mix the material 14 as it falls from the housing 15 with the fluid food product 22.

Referring to figure 1b of the drawings there is illustrated a mixing device 10 according to a second embodiment of the present invention. The mixing device 10 of the second embodiment is substantially the same as the mixing device 10 of the first embodiment and so like features have been referenced using the same numbers. However, the distal end of the mixing arm 19 of the second embodiment is coupled to a whisk arrangement 23 comprising a plurality of wire loops 24 which is similarly arranged to stir the fluid food product 22 and this mix the dry food product 14 as it falls from the housing 15. It is envisaged that the blade 21 and whisk arrangement 23 of the first and second embodiments respectively, may be detachably coupled to the mixing arm 19 so that the mixing device 10 may be adapted to suit the preparation of a particular food product or to achieve a particular fluid consistency of the food product.

In use, a user 25 places the required amount to water for example, within the receptacle 12 and places the lid 11 comprising the mixing device 10 upon the receptacle 12 such that the mixing blade 21 or whisk arrangement 23 disposed at the distal end of the mixing arm 19 extends within the water. The user 25 subsequently places the required amount of dry food product 14 into the housing 15 through the first aperture 17, as illustrated in figure 3, and then closes the first aperture 17 by sliding the first closure 18 across the first aperture 17. Once the dry food product 14 has been placed within the housing 15, the user 25 switches on the drive unit (not shown) to cause the mixing arm 19 to rotate and thus cause the blade 21 or whisk arrangement 23 disposed within the water to rotate to stir the water and simultaneously to cause the blade (not shown) disposed within the housing 15 to rotate and thus move the food product 14 around the housing 15.

If required, the water within the receptacle 12 may be heated by placing the receptacle upon a hob of a cooker 26, for example and when the water reaches the desired temperature, the user 25 also opens the second aperture (not shown) disposed at the lower region of the housing 15 such that as the blade (not shown) disposed within the housing 15 rotates therein, the food product 14 is passed across the aperture (not shown). During this motion of the blade, a portion of the food product 14 becomes dispensed from the housing 15 into the water within the receptacle 12. The provision of the perforated cover or grate (not shown) across the second aperture (not shown) serves to limit the amount of dry food product 14 which passes through the second aperture (not shown) as the blade (not shown) moves across the second aperture (not shown), and further serves to disperse the food product 14, such that the food product 14 becomes sprinkled into the receptacle 12. The gradual addition of the dry food product 14 into the water/fluid food product enables the dry food product 14 to become suitably mixed therein and thus minimises the development of any lumps of dry food product. As the mixing arm 19 continues to rotate, further food product 14 becomes gradually added to the water/fluid food product until eventually, the entire food product 14 has been added.

In an alternative embodiment which is not illustrated, it is envisaged that the opening and closing of the second aperture (not shown) maybe controlled by a sensing arrangement (not shown) which is arranged to sense the temperature of the water within the receptacle 12. Accordingly, this would obviate the requirement for the user

25 to initially monitor the water within the receptacle 12 to determine when the water reaches the required temperature in order to determine when to open the second aperture (not shown). In this respect, the sensing arrangement (not shown) would further reduce the required supervision in the preparation of the fluid food product 22.

In yet a further embodiment which is also not illustrated, the mixing device 10 may comprise heating means (not shown) such as a heating element (not shown), which is arranged to heat the fluid 22 within the receptacle 12. It is envisaged that the heating element (not shown) may be disposed within the mixing blade 21 or whisk arrangement 23 disposed at the distal end of the arm 19, for example. Accordingly, the mixing device 10 would then enable food products such as gravy to be prepared away from a cooker 26, such as upon a table top (not shown) and continuously heated to ensure that the food product remains hot until it is required.

From the foregoing therefore it is evident that the mixing device of the present invention provides for simple yet effective means of preparing a fluid food product.

Claims

1. A mixing device for the preparation of a fluid product within a receptacle, the device comprising a dispenser for dispensing material into the receptacle, a mixing arm which extends from the dispenser and which is arranged to extend into the fluid, and drive means for causing the arm to rotate to mix the fluid,

wherein the dispenser is arranged to dispense material into the receptacle in dependence of the rotation of the mixing arm.

2. A mixing device according to claim 1, wherein the dispenser comprises a housing comprising a first aperture disposed at an upper region thereof for receiving the material into the housing and a second aperture disposed at the lower region thereof through which the material can pass from the housing into the receptacle.

3. A mixing device according to claim 2, wherein the first and second apertures comprise respective closures which are movable between a first position in which the aperture is substantially closed, and a second position in which the aperture is substantially open.

4. A mixing device according to any preceding claim, further comprises sensing means for sensing the temperature of the fluid within the receptacle.

5. A mixing device according to claim 4 as appended to claim 3, wherein the closure of the second aperture is movable between the first and second positions in dependence of the sensed temperature.

6. A mixing device according to any preceding claim wherein the drive means is disposed within the housing and is coupled with a proximal end of the mixing arm.

7. A mixing device according to any preceding claim, wherein the mixing arm is coupled to a mixing blade or whisk arrangement or similar.

8. A mixing device according to any preceding claim, further comprising agitation means for agitating the material within the housing in dependence of the rotation of the mixing arm.

9. A mixing device according to claim 8, wherein the agitation means comprises a blade which is coupled to the drive means and which is arranged to cause material disposed within the housing, to pass out from the housing through the second aperture.

10. A mixing device according to claim 9, wherein the blade is arranged to rotate within the housing.

11. A mixing device according to any preceding claim, wherein further comprising heating means for heating the fluid within the receptacle.

12. A receptacle which is arranged to hold a fluid, the receptacle comprising a mixing device according to any preceding claim.

Application No:	GB1005598.6	**Examiner:**	Elizabeth Price
Claims searched:	1-12	**Date of search:**	13 July 2011

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-12	US 6089143 A (FIGUEROA) see whole document
X	1, 12 at least	JP 04260429 A (KAO) see EPODOC abstract, WPI abstract accession # 1992-360450 [44] and figure 1
X	1-12	GB 2088736 A (MANN & HUMMEL FILTER) see whole document
X	1, 12 at least	DE 3400023 A1 (SCHWARZ) see EPODOC abstract, WPI abstract accession # 1985-178155 [30] and figure
X	1, 12 at least	JP 58067328 A (YAMAZAKI) see EPODOC abstract, WPI abstract accession # 1983-52493K [22] and figure
X	1, 12 at least	FR 2542215 A1 (BICHARD) see EPODOC abstract, WPI abstract accession # 1984-258393 [42] and figures
X	1, 12 at least	DE202007019053 U (BOHLE MASCH) see WPI abstract accession # 2010-G79776 [41] and figure 1
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X	1-12	GB 770258 A (GORT) see whole document
A	-	US 5711602 A (ROHRING)

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if	P	Document published on or after the declared priority date but

	combined with one or more other documents of same category.		before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[X] :

Worldwide search of patent documents classified in the following areas of the IPC

A47J; B01L

The following online and other databases have been used in the preparation of this search report

WPI and EPODOC

International Classification:

Subclass	Subgroup	Valid From
B01F	0015/02	01/01/2006
A47J	0036/06	01/01/2006
A47J	0036/16	01/01/2006
B01F	0003/12	01/01/2006
B01F	0007/00	01/01/2006
B01F	0007/16	01/01/2006