Title: FOOD PREPARATION ARRANGEMENTS

Abstract: A food preparation arrangement is described, comprising a kitchen appliance (10,110) having an electric motor housed within a casing, a support location (30,130,140) for a receptacle having a processing tool for processing ingredients in the receptacle, and a motor-driven driver to activate the processing tool when the receptacle is supported at the support location (30,130,140). The arrangement further comprises a weighing device (60,150,180) dimensioned and configured to fit beneath and support the kitchen appliance (10,110) and to generate electrical signals, representing the weight of the ingredients, and a transmission link over which the electrical signals can be conveyed to the appliance (10,110), enabling the weight of the ingredients to be shown on a display device (70,122,190) provided on the appliance (10,110). The transmission link may include a direct electrical connection, such as a plug-and-socket connection, or a contactless link, comprising one or more of: a radio-frequency (RF) link; an infra-red (IR) or other optical link; or a Bluetooth connection.
FOOD PREPARATION ARRANGEMENTS

This invention relates to food preparation arrangements incorporating electrically powered kitchen appliances. Such kitchen appliances include, for example:

1) stand mixers, by which is meant the kind of kitchen appliance in which a mixing bowl is supported on a pedestal which also supports an electric motor and a drive system including a drive outlet, overhead of the bowl, which permits a planetary mixing action to be imparted to tools suspended into the bowl from the overhead drive outlet;

2) food processors, by which is meant the kind of kitchen appliance in which a rotary tool mounted in the base a bowl is driven from beneath the bowl by means of a suitable drive coupling from an electric motor; and

3) blenders, which are similar to food processors, and indeed are often combined therewith, and which include a tool, mounted in a goblet or similar vessel, driven from beneath the goblet.

Such kitchen appliances are well known and established, and each form has respective capabilities; the more expensive stand mixers usually being capable of performing a wider range of functions than the food processors and blenders. Nevertheless, in respect of all such appliances, there is a continuous drive to increase their functionality and general usefulness without substantially increasing their price to the end-user.
It is, for example, generally the case that when any of the foregoing appliances is used to prepare ingredients for a recipe, additional equipments, such as weighing scales, have to be utilised to proportion the ingredients correctly. This tends to cause clutter on the work-top as a user prepares the ingredients, and also can create a problem of, storing the various appliances and equipment when they are not in use.

Several prior proposals have been made, over many years, for incorporating additional functionality, such as weighing scales, into powered appliances used for food preparation. For example, DE-1894430-U shows a food processor having one of its supporting feet spring-loaded and constructed so as to be capable of telescoping into the casing of the processor to an extent determined by the weight of the processor and any ingredients in the bowl thereof. The telescopic foot is mechanically linked to a visual display which can indicate the weight of ingredients placed in the processor bowl. It will be appreciated that, although the scale thereby incorporated into the food processor effectively weighs the entire food processor plus the bowl and any ingredients therein, the display can be "zeroed" or otherwise compensated to effectively subtract the static weight of the food processor components from the overall weight. Developments of the same basic concept are described, for example, in: US-5174403; WO-91/07862 and EP-1 123678.

AU of the foregoing proposals, however, require the incorporation of weighing components into the subject kitchen appliance, and this can be disadvantageous in terms of cost and reliability, for example.
One object of the invention is to provide a food preparation arrangement incorporating a powered kitchen appliance with a weighing function which is economical and reliable and, moreover, does not substantially increase the footprint of the appliance.

Another object of the invention is to provide such an arrangement for which storage requirements are not substantially increased beyond those necessary for the appliance alone.

According to the invention, there is provided a food preparation arrangement comprising a kitchen appliance having an electric motor housed within a casing, a support location for a receptacle for ingredients and drive means for utilising motive power provided by said motor to activate at least one processing tool within said receptacle when supported at said support location, thereby causing said at least one tool to interact with the ingredients in a predetermined way; the arrangement further comprising a weighing device dimensioned and configured to fit beneath and support said appliance and to generate electrical signals indicative of a weight of ingredients in said receptacle, and transmission means for conveying said electrical signals to said appliance, and wherein said appliance includes a display and means capable of utilising said electrical signals to cause said display to indicate said weight of ingredients.

In one preferred embodiment, the transmission means comprises a direct electrical connection by way of a plug-and-socket connector which includes co-operative components on the weighing device and the kitchen
appliance; these components being so relatively configured and sited as to automatically dock, and thereby establish said connection, when the appliance is operatively placed on the weighing device. By this means, reliable communication is economically established between the appliance and the weighing device.

When a direct electrical connection such as the foregoing is used, it is preferred that techniques of proven reliability and acceptability in the kitchen environment, such as (for example) any of those used to connect electrically-powered bases to so-called "cordless" kettles, are employed.

In other preferred examples of the invention, the transmission means may comprise a contactless transmission channel, such as a radio-frequency (RF) link, an infra-red (IR) or other optical link, a Bluetooth connection, or any other coupling capable of transferring the weight data from the weighing device to the kitchen appliance.

In some preferred embodiments, two-way communication is established between the weighing device and the kitchen appliance to allow, for example, the weighing device to be disabled under certain operational circumstances, or to allow for selection of differing accuracy and/or loading levels. In some such embodiments, the weighing device may comprise a plurality of weighing sensors, and a signal from the kitchen appliance may be used to select differing numbers and/or interconnections of the sensors, depending upon the type and/or upon certain operational criteria of the kitchen appliance.
The weighing device is preferably formed with an upper surface dimensioned and configured to match the base of the kitchen appliance.

In some embodiments, the base of the kitchen appliance is formed with a plurality of feet and the said upper surface of the weighing device is formed with a corresponding plurality of sockets into which the feet can be accommodated. In such embodiments, the electrical connection or other communications link between the weighing device and the kitchen appliance can usefully be made at, or in close proximity to, one or more of the foot-and-socket locations.

The weighing device may utilise strain gauges as the weight-sensing elements thereof. Any or all of such strain gauges may be associated with or disposed adjacent, areas at which said foot-receiving sockets are provided. Alternatively, any or all of the strain gauges may be provided at or adjacent feet, provided on the underside of the weighing device and providing a stable support for the kitchen appliance.

Any feet provided on the base of the weighing device may or may not align with the feet of the kitchen appliance, depending upon design preference and/or functional or operational criteria such as the overall operating height of the kitchen appliance as supported on the weighing device.

In order that the invention may be clearly understood and readily carried into effect, one embodiment thereof will now be described, by way of example only, with reference to the accompanying drawings, of which:
Figures 1, 2 and 3 show respectively perspective, front elevation and side elevation views of an arrangement in accordance with one example of the invention, comprising a stand mixer supported upon a weighing device having a flattened, box-like profile;

Figures 4a and 4b show, schematically, arrangements whereby signal communication can be established between a weighing device and a kitchen machine; and

Figures 5 and 6 show food processors similarly supported upon weighing devices.

Referring now to Figures 1, 2 and 3, a stand mixer 10 comprises a pedestal 20 which supports a bowl platform 30 and a housing 40. The housing 40 encloses, in conventional fashion, an electric drive motor (not shown) and gearing (not shown) which conveys the motive power supplied by the motor to a plurality of drive outlets to which various tools can be attached to perform a wide variety of tasks in the kitchen.

In this particular example, there is provided a high-speed blender drive outlet behind covers 41, a slow-speed mincer drive outlet behind cover 42 and a planetary drive, intended for food mixing, overhead of the bowl location, at 43, although it will readily be appreciated that more, fewer and/or different drive outlets can be provided in accordance with desired functionality of the stand mixer.
A shanked mixing tool, attached as is conventional, to a socket 44 of the outlet 43, will depend in use into a mixing bowl placed on the bowl platform 30, and is configured to rotate about both the axis of the socket 44 and the central axis 45 of the outlet 43, thus performing a planetary mixing action. The necessary relationships between the relative shapes and dimensions of the bowl and the mixing tool to ensure thorough and repeatable mixing of ingredients are well known and established in use over many years.

As shown, the stand mixer 10 is, in this example, provided with a pair of latches 31, 32 within a recess 33 provided in the bowl platform 30, which latches co-operate with components on the base of the bowl to form a bayonet latching system which ensures firm and ready location of the bowl on its platform. Other latching systems, such as screw-threading for example, can be used as an alternative to bayonet latching if preferred.

The upright part 46 of the housing 40 is configured with a break line 47, and a tilt mechanism of known kind to permit the top part 48 of the stand mixer to be hinged away from the platform 30 end of the pedestal part 20, in order to facilitate the insertion and removal of the mixing tools and the bowl.

The stand mixer 10 also incorporates electrical and mechanical user controls 51, 52 in conventional fashion.

In a first example of an arrangement in accordance with the present invention, the stand mixer described thus far is supported on a weighing
device 60 of flat profile; the weighing device 60 in this example being provided with a plurality of load cells comprising strain gauges which are connected, in known fashion, into bridge circuits to develop usable electrical signals indicative of the weight sensed by the load cells; in this case, the weight of the stand mixer 10.

In this example, the weighing device 60 is shaped in plan to match the shape of the pedestal 20 of the stand mixer 10. This need not be the case, however, and the weighing device 60 can, if desired, follow any design in plan, for example rectangular, elliptical or circular, though it is preferable for the weighing device profile to remain reasonably close to the footprint of the stand mixer, in order to preserve space on the working surface used to support the stand mixer when in use. In any event, the weighing device 60 should be thin so that its use beneath the stand mixer 10 does not unduly increase the operating height of the mixer, from the standpoint of a user.

Further background information regarding the construction and implementation of load cells of the kind usable in the weighing device hereof, and the associated electrical circuitry, may be found, for example, in US-4432247-B1, to which reference is invited.

The electrical signals generated by the weight sensors within the weighing device 60 are communicated to the main kitchen appliance, i.e. the stand mixer 10 in this example, where they are further processed as necessary and used to drive a display, such as a liquid crystal display (LCD) 70 which is provided on the stand mixer 10 at a convenient
location for viewing. It will be appreciated that the location shown in Figures 1 and 3 may not be a preferred location and that the LCD 70 may be sited at any suitable location on the body of the stand mixer 10. Furthermore, the LCD 70 need not be configured as a flat panel flush with the casing 40 of the food mixer. Instead, it may be angled relative to the casing 40 for better viewing, or the display may be hingedly or otherwise pivotally mounted to the casing 40 so that, when in use, it can be tilted into a preferred viewing position by the user.

A panel 71 containing reset and other operational switch actuators such as 72 and 72 may also be provided.

It will be appreciated that processing of the electrical signals generated by the weight sensors incorporated in the weighing device 60 can be implemented in the stand mixer 10, in the weighing device 60 or may be distributed between the stand mixer and the weighing device in any manner that proves convenient to implement.

The weighing device 60 typically has a flat and low profile, in order to avoid raising the operating height of the stand mixer 10 to an unacceptable extent and so as not to compromise the stability of the stand mixer. It need not, however, be formed as a flat, box-like structure as shown and may, if preferred, be constructed as an open network of arms extending from a central location to respective support locations for the feet of the kitchen appliance associated therewith. In such circumstances, the weight sensors are disposed at one or more of the support locations, and the electrical signals generated by the sensors are ducted along the
arms to a convenient common location for combination and/or porting to the kitchen appliance.

The weighing device 60 in this example is provided with indented, well-like receptors (see Figure 4a) such as 61 and 62; each receptor being dimensioned to accommodate a respective foot (not shown) of the kitchen appliance 10. It will be appreciated that not all of the feet, and thus receptors, need be of the same size. In any event, the load cells of the weighing device are, in this example of the invention, disposed to support one or more of the feet of the stand mixer 10.

The weighing device 60 may or may not be provided with its own set of feet. If it is, the feet of the weighing device may or may not align with those of the stand mixer. Indeed, the feet of the weighing device may not conform in number or pattern to the feet on the stand mixer.

If the weighing device 60 is not provided with feet, it may usefully incorporate a peripheral resilient pad around its base, to provide stability and enhanced vibration damping.

In one preferred embodiment, the electrical signals generated by the weight sensors within the weighing device 60 are communicated to the main kitchen appliance, i.e. the stand mixer 10 in this example, by way of a direct electrical connection (not shown) which can take any convenient form, such as a plug-and-socket connector which includes co-operative components on the weighing device and the kitchen appliance; these components being so relatively configured and sited as to automatically
dock, and thereby establish said connection, when the appliance is operatively placed on the weighing device. By this means, reliable communication is economically established between the appliance and the weighing device.

When a direct electrical connection, such as the plug-and-socket connector mentioned above, is used, it is preferred that techniques of proven reliability and acceptability in the kitchen environment, such as (for example) any of those used to connect electrically-powered bases to so-called "cordless" kettles, are employed.

Referring now to Figure 4b, there is shown one way in which contactless signal communication can be conveniently established between the weighing device 60 and the stand mixer 10. Figure 4b shows, on an enlarged scale, one of the well-shaped receptors, 61, formed in the upper surface 63 of the weighing device 60. Part at least of the upright wall of the receptor 61 is provided with a-window 64 transmissive of infra-red (IR) radiation.

Electrical signals generated by the load cells (not shown) of the weighing device 60 are used to modulate a signal carrier and then converted into IR radiation and applied to an IR emitter 65, directed at and through the window 64. That foot 21 of the stand mixer 10 which, in use of the arrangement, is accommodated in the receptor 61 is hollowed and provided with an aperture 22 which is aligned with the IR emitter 65. The aperture 21 is preferably closed by means of an IR-transmissive window.
In any event, the modulated IR radiation transmitted into the foot 21 by way of the aperture 22 is detected by a receiver 23 and converted back into electrical signals which are fed by way of electrical cabling 24 into the body of the stand mixer 10 to a convenient location for processing and distribution to the display 70. In an alternative arrangement, the modulated IR radiation transmitted into the foot 21 by way of the window 22 can be communicated into the stand mixer body by means of an IR-transmitting fibre or duct, and there converted back to electrical signals.

Lensing or other focussing or treatment of the IR radiation can be implemented by the window 64, any window in the aperture 22 and/or by separate lens components as required.

As mentioned previously, contactless communications other than those based on IR transmission can be used, and the invention envisages, for example, the use of such alternatives as radio-frequency (RF) transmissions and Bluetooth communications protocols.

Figures 5 and 6 show arrangements in accordance with other embodiments of the invention, as applied to differing forms of food processor, but all comments made above concerning the weighing device and its communication with the kitchen appliance supported thereon apply (mutatis mutandis) to these embodiments also.

The food processor 110 shown in Figure 5 includes a casing 120 which, as is well known, houses an electric motor (not shown) and a drive
system (not shown) disposed and arranged to provide rotational drive outputs for use with a blender section 130 and a food processor section 140.

The blender section 130 comprises a relatively high platform 131, atop the part 121 of the casing 120 which houses the motor; the platform having associated therewith a relatively high speed drive outlet, typically running at the operational speed of the motor and configured to drive a rotary tool located in the base of a goblet 132. The goblet 132 is formed, as is known, with a spout 133 and a handle 134, and it is capped by a removable lid 135. An interlock system is normally provided to prevent operation of the motor unless the lid 135 is correctly attached to the goblet 132.

The food processor section 140 comprises a relatively low platform 141 beneath which, and within a lower part 122 of the casing 120, are provide elements of a speed-reduction system, linked to the motor, which provides, centrally of the platform 141, a relatively lower speed drive outlet capable of rotating cutting, chopping and other tools inserted into a blender bowl 142. The bowl 142 has a handle 143, a lid 144 and a feed-tube 145 through which ingredients can be added to the bowl whilst the motor is running, provided that the lid 144 is in place on the bowl 142.

Usually, the dimensions of the feed tube 145 are configured so as to prevent insertion of a user’s hands or fingers into the bowl therethrough, at least to within touching distance of the rotating tool. Some food processors, however, utilise a wide feed-tube to allow the addition of
relatively large ingredients to the bowl. Such wide feed-tubes are provided with further interlocks to protect the user; such further interlocks usually being based around the detection of a pushing device in correct placement in the tube, whereby the user has to employ the pushing device to urge ingredients into the bowl 142, and the motor will not run unless the pushing device is located in the feed-tube. In accordance with an embodiment of the present invention, the processor 110 is supported on a weighing device 150 of thin profile, like the weighing device 60 previously described. In this case, the weighing device 150 is configured in plan to follow the outline of the base moulding of the processor 110, but this need not be the case and the plan configuration of the weighing device 150 can take any convenient form.

The processor 110 is provided with an LCD 122 on the casing part 121 to display weight information derived from the signals generated within the weighing device 150. Clearly, the display may be sited elsewhere on the processor 110 and/or take a different form than the simple window-like arrangement shown in Figure 5, as mentioned in connection with the LCD 70 with reference to the embodiment of the invention described with reference to Figures 1 to 3.

Arrangements in accordance with the present invention can be advantageously applied to food processors of varying kinds, such as (by way of example only) the kind shown in Figure 5 and that shown in Figure 6, wherein a box-like casing 160 supports a single platform 161 which can support and drive (by way of coaxially located drive outlets, as is known) rotary tools comprised in either a blender goblet (not shown) or
a food processor bowl 172. The bowl 172 has a handle 173, a lid 174 and a feed-tube 175, similar to the components 143, 144 and 145 of the processor described with reference to Figure 5, and to which similar comments apply.

The processor 160, in accordance with this embodiment of the invention, is supported upon a weighing device 180, which may comprise an integral, shallow, box-like housing or may be constructed with individual housing portions, each associated with a respective foot such as 162 of the processor 160 and linked by arms, as described above, to provide a distributed but unitary weighing device.

In this embodiment, and bearing in mind that food processors of the kind shown in Figure 6 tend to be marketed at higher price points than those of the kind shown in Figure 5, the food processor 160 comprises a more sophisticated LCD 190 which is normally housed in a recess 191 in the casing surface of the processor 160, but which can be swung outwardly when required to an angle that a user finds convenient for viewing. The LCD 190 may also be configured to provide touch-screen control facilities.

The invention thus provides an arrangement whereby, whichever form of kitchen appliance is used, the total weight of the appliance, plus any ingredients in its bowl, is determined by one or more weighing devices, such as strain gauges, strategically positioned within a weighing device which is separate from, but closely associated with, the kitchen appliance and communicates weight information thereto. This enables a weight of
ingredients added to the bowl to be calculated by deduction of the standing weight of the appliance. The weight so calculated is displayed visually to the user, preferably on an LCD display.

It will be understood that the principal purpose of the weighing devices such as 60, 150 and 180 comprised in arrangements in accordance with the invention is to weigh ingredients used in the associated kitchen appliance without adding significantly to the overall working height of the associated kitchen appliance, without requiring significant additional storage capacity beyond that needed for the appliance and without substantially increasing the footprint of the appliance when deployed for use on a work-top or other food preparation surface.

To that end, some embodiments of the invention provide for the weighing device and the kitchen appliance to be usable and transportable as a joined entity. In such embodiments, the weighing device and the kitchen appliance are latchable together, in their operative configuration, by magnetic and/or mechanical latches of any convenient kind. In that way, the weighing device is automatically picked up, together with the kitchen appliance, when the appliance is lifted from its working surface after use, and can be stored away still attached to the appliance. The weighing device can, in most such embodiments, be de-latched from the kitchen appliance to allow usage of the appliance separately from the weighing device if preferred.

The weighing device may be provided with a visual display of its own, to permit its use separately from the kitchen appliance if desired. The
display is usually sited on the upper surface of the weighing device, and so not directly visible when the associated kitchen appliance is supported on that same surface. If desired, the display on the weighing device itself can automatically be blanked when the device is in use with its associated kitchen appliance. Alternatively, the weighing device may be provided with a display mounted to a tray or drawer normally housed inside the body of the weighing device, but which can be withdrawn for viewing when desired. An interlock may prevent withdrawal to the viewing position of the tray or drawer whilst the associated kitchen appliance is supported on the weighing device.

In order to facilitate lifting or other handling of the kitchen appliance and the weighing device together, the weighing device may be provided with handles. It is preferred, in order to preserve the clean look of the arrangement, and to keep any dimensional increase of the arrangement over the dimensions of the kitchen appliance itself as small as practicable, that any handles so provided are normally housed in recesses in the body of the device, and are withdrawn from the recesses only when needed for lifting or otherwise handling the arrangement.
Claims:

1. A food preparation arrangement comprising a kitchen appliance having an electric motor housed within a casing, a support location for a receptacle for ingredients and drive means for utilising motive power provided by said motor to activate at least one processing tool within said receptacle when supported at said support location, thereby causing said at least one tool to interact with the ingredients in a predetermined way; the arrangement further comprising a weighing device dimensioned and configured to fit beneath and support said appliance and to generate electrical signals indicative of a weight of ingredients in said receptacle, and transmission means for conveying said electrical signals to said appliance, and wherein said appliance includes a display and means capable of utilising said electrical signals to cause said display to indicate said weight of ingredients.

2. An arrangement according to claim 1, wherein the transmission means comprises a direct electrical connection by way of a plug-and-socket connector which includes co-operative components on the weighing device and the kitchen appliance.

3. An arrangement according to claim 2, wherein said co-operative components are so relatively configured and sited as to automatically dock, and thereby establish said connection, when the appliance is operatively placed on the weighing device.
4. An arrangement according to claim 2 or claim 3, wherein said plug-and-socket connector comprises a connector of a kind used to connect electrically-powered bases to so-called "cordless" kettles.

5. An arrangement according to claim 1, wherein said transmission means may comprise a contactless transmission channel, comprising one or more of: a radio-frequency (RF) link; an infra-red (IR) or other optical link; or a Bluetooth connection capable of transferring the weight data from the weighing device to the kitchen appliance.

6. An arrangement according to any preceding claim, wherein, two-way communication is provided between the weighing device and the kitchen appliance.

7. An arrangement according to claim 6, wherein the weighing device comprises a plurality of weight sensors, and a signal from the kitchen appliance is used to select differing numbers and/or interconnections of the sensors.

8. An arrangement according to any preceding claim, wherein the weighing device is formed with an upper surface dimensioned and configured to match the base of the kitchen appliance.

9. An arrangement according to any preceding claim, wherein the base of the kitchen appliance is formed with a plurality of feet and an upper surface of the weighing device is formed with a corresponding plurality of well-like receptors into which the feet can be accommodated.
10. An arrangement according to claim 9, wherein the electrical connection or other communications link between the weighing device and the kitchen appliance is made at, or in close proximity to, one or more of the foot-and-receptor locations.

11. An arrangement in accordance with any preceding claim, wherein the weighing device comprises one or more strain gauges as a weightsensing element thereof.

12. An arrangement according to claim 11, wherein at least one of such strain gauges is disposed adjacent an area at which a said foot-receiving receptor is provided.

13. An arrangement according to claim 11 or claim 12, wherein at least one said strain gauge is disposed at or adjacent a foot, provided on the underside of the weighing device and providing a stable support for the kitchen appliance.

14. An arrangement according to any preceding claim, wherein said display comprises an LCD.

15. An arrangement according to any preceding claim, wherein said display comprises a panel mounted flush with a casing component of said kitchen appliance.
16. An arrangement according to any of claims 1 to 14, wherein said display comprises a panel which is hingedly mounted to a casing of the kitchen appliance and can be tilted outwardly from said casing for use.

17. An arrangement according to any preceding claim, wherein the weighing device and the kitchen appliance are adapted to be usable and transportable as a joined entity.

18. An arrangement according to claim 17, further comprising latching means for latching the weighing device and the kitchen appliance together, in their operative configuration; said latching means comprising one or more of a magnetic and a mechanical latch whereby the weighing device is automatically picked up, together with the kitchen appliance, when the appliance is lifted from its working surface after use, and can be stored away still attached to the appliance.

19. An arrangement according to claim 19, wherein the weighing device can be de-latched from the kitchen appliance to allow usage of the appliance separately from the weighing device.

20. An arrangement according to any preceding claim, wherein the weighing device is provided with a visual display of its own, to permit its use separately from the kitchen appliance.

21. An arrangement according to claim 20, including means for automatically blanking the visual display on the weighing device itself when the device is in use with its associated kitchen appliance.
22. An arrangement in accordance with claim 20, wherein the weighing device includes a display mounted to a tray or drawer normally housed inside the body of the weighing device, but which can be withdrawn for viewing when desired.

23. An arrangement according to claim 22 further comprising an interlock adapted to prevent withdrawal to the viewing position of the tray or drawer whilst the associated kitchen appliance is supported on the weighing device.
Fig 1
**A. CLASSIFICATION OF SUBJECT MATTER**

INV. A47J43/07

According to International Patent Classification (IPC) or to both national classification and IPC.

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>A47J43/07</td>
<td></td>
</tr>
</tbody>
</table>

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched:

**Electronic data base consulted during the international search (name of data base and, where practical, search terms used)**

- EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP 1 731 068 A (ELECTRODOMESTICOS TAURUS S L [ES]) 13 December 2006 (2006-12-13)</td>
<td>1, 8, 11, 13, 14, 17, 18</td>
</tr>
<tr>
<td>column 5, paragraph 14 - column 7, paragraph 19 figures 1, 2</td>
<td></td>
</tr>
<tr>
<td>US 5 174 403 A (GEIGER PETER [DE]) 29 December 1992 (1992-12-29)</td>
<td>1, 8, 11, 13-18</td>
</tr>
<tr>
<td>cited in the application column 5, line 28 - column 8, line 37 figures 1, 3</td>
<td></td>
</tr>
<tr>
<td>FR 2 651 982 A1 (RONIC IND [FR]) 22 March 1991 (1991-03-22)</td>
<td>1, 8, 9, 11, 13-17</td>
</tr>
<tr>
<td>page 2, line 30 - page 5, line 23 figures 1-3, 5</td>
<td></td>
</tr>
</tbody>
</table>

**Further documents are listed in the continuation of Box C**

**See patent family annex**

- Special categories of cited documents
  - "A" document defining the general state of the art which is not considered to be of particular relevance
  - "E" earlier document but published on or after the international filing date
  - "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  - "O" document referring to an oral disclosure, use, exhibition or other means
  - "P" document published prior to the international filing date but later than the priority date claimed
  - "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
  - "X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
  - "Y" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
  - "Z" document member of the same patent family

**Date of the actual completion of the international search**

16 July 2007

**Date of mailing of the international search report**

24/07/2007

**Name and mailing address of the ISA/Authorized officer**

European Patent Office, P B 5818 Patentlaan 2
NL-2280 HU Rijswijk
Tel (+31-70) 340-2040, Tx 31 651 epo nl
Fax (+31-70) 340-3016

Kempeneers, Johanna
<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>US 5 799 567 A (DOERNER STEFAN [DE])</td>
<td>1,2,8,9, 11,14-18</td>
</tr>
<tr>
<td></td>
<td>1 September 1998 (1998-09-01)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>column 4, Line 62 - column 7, line 55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>column 9, line 8 - line 17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>figures 1-13,18</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>WO 01/52515 A1 (THALIA PRODUCTS INC [US])</td>
<td>1,11, 13-15</td>
</tr>
<tr>
<td></td>
<td>19 July 2001 (2001-07-19)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>page 21, line 11 - line 12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>page 23, line 1 - line 27</td>
<td></td>
</tr>
<tr>
<td></td>
<td>figures 9A,9B,10</td>
<td></td>
</tr>
<tr>
<td>Patent document cited in search report</td>
<td>Publication date</td>
<td>Patent family member(s)</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>EP 1731068</td>
<td>13-12-2006</td>
<td>NONE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 3505972 T</td>
</tr>
<tr>
<td>FR 2651982</td>
<td>22-03-1991</td>
<td>NONE</td>
</tr>
<tr>
<td>US 5799567</td>
<td>01-09-1998</td>
<td>AT 167031 T</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AU 2561595 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CA 2189016 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CN 1151680 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CZ 9602876 A3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DE 4414824 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DK 757532 T3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 9529617 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ES 2117424 T3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HU 74836 A2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 3667338 B2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 9512452 T</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PL 316763 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SK 132096 A3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 2002011923 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 6807463 B1</td>
</tr>
</tbody>
</table>