A DISPENSING APPARATUS

The invention relates to a dispensing control mechanism (30) for use with a dispensing apparatus (10) of the type that dispenses a flowable substance, such as ice cream. The dispensing control mechanism (30) is mechanically linked with the dispensing apparatus (10) to which it is operatively applied in a configuration in which a displacement arrangement thereof, by its operation, can displace a closure member (18) of the dispensing apparatus (10) which permits or blocks the passage of flowable substance from the apparatus. Operation of the displacement arrangement is electronically controlled, the associated electronic control means enabling controlled dispensing of a flowable substance from the dispensing apparatus.
Published:
— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
A DISPENSING APPARATUS

THIS INVENTION relates to a dispensing apparatus.

The invention relates particularly to a dispensing control mechanism for use with a dispensing apparatus of the type that dispenses flowable foodstuff substances such as ice creams, various drinking liquids, and the like. Known dispensing apparatus provided for the above purpose include an operating lever that is operatively linked to a closure member, sometimes via a coupling formation, the operating lever being displaceable between a first position, in which the closure member is in a blocking position and blocks a feed passage through which the required substance is to be dispensed from the apparatus, and a second position, in which the closure member is in an open position and the passage of the substance through the feed passage for dispensing thereof is permitted.

An apparatus for dispensing particularly ice cream of the type known as "soft serve" includes also a container part, in which ice cream to be dispensed is contained, and which communicates with displacement means, such as a screw feed, for displacing the ice cream from the container part via the feed passage to a dispensing nozzle, through which the ice cream is dispensed into a receiving container, e.g. a cone or a cup. Dispensing occurs in response to operation of the operating lever which results in the
required displacement of the closure member and activation of the screw feed, dispensing thus in effect being manually controlled.

A disadvantage associated with the use of a dispensing apparatus of the above type is that because of its manual lever operation, it is difficult to control accurately the quantity of flowable foodstuff substance being dispensed, whether it be in terms of mass or volume. This manual operation often results in either too little substance being dispensed, resulting potentially in customer dissatisfaction, or too much substance being dispensed, resulting in substance being dispensed but not charged for. The manual operation of the operating lever also exposes the dispensing apparatus to abuse, in that substance can be dispensed from the apparatus for unauthorized purposes. It is an object of this invention to at least ameliorate the abovementioned disadvantages.

Insofar as the invention relates particularly to a dispensing control mechanism for use with a dispensing apparatus of the above general type, that permits dispensing of ice cream, or any other flowable substance, by manual operation of an operating lever that displaces a closure member and effectively controls dispensing of the required substance, in whichever way it is displaced to a dispensing nozzle, any reference hereinafter to a dispensing apparatus must be interpreted as a reference to an apparatus of the above general type. Dispensing apparatus of this type also is well known and is thus not described in further detail herein.

According to the invention there is provided a dispensing control mechanism for use with a dispensing apparatus, for dispensing a flowable food substance, which includes a displaceable closure member which, through its displacement between a blocking position, in which it blocks a feed passage through which a flowable substance must pass to be dispensed, and an open position, in which a flowable substance can pass through the feed passage, controls dispensing of the flowable substance from the dispensing apparatus via the feed passage, the dispensing control mechanism including
a displacement arrangement that can be mechanically linked with a closure member of a dispensing apparatus and permit, through its operation and when so linked, displacement of the closure member of the dispensing apparatus between its blocking position and its open position; and

electronic control means which is operable for controlling the operation of the displacement arrangement.

The dispensing control mechanism generally will be provided as an integrated unit that can fit as such on a particular dispensing apparatus, i.e. an integrated unit that is particularly adapted for use on a specific dispensing apparatus, or possibly a range of specific dispensing apparatus. When so fitted, operation of the control means of the dispensing control mechanism clearly will control the operation of the displacement arrangement and, thereby, displacement of the closure member of the dispensing apparatus, whereby dispensing of a substance from the apparatus is thus controlled.

The displacement arrangement of the dispensing control mechanism of the invention may be a piston/cylinder mechanism that can be mechanically linked with the closure member of a dispensing apparatus in a configuration in which displacement of the piston within the cylinder of the piston/cylinder mechanism will provide for displacement of the closure member between its blocking position and its open position. The piston/cylinder mechanism either may be directly linked with the closure member or may be linked with a coupling formation that is configured to couple the piston/cylinder mechanism with the closure member of a dispensing apparatus. This coupling formation particularly may be the coupling formation that provides a link with a conventional operating lever of the dispensing apparatus, the operating lever being removed in order to accommodate the dispensing control mechanism.

The dispensing control mechanism may include connector means for connection to a compressed fluid supply for rendering the piston/cylinder mechanism either hydraulically
or pneumatically operable. Alternatively, the dispensing control mechanism may include electrically energiseable drive means for operating the piston/cylinder mechanism via operation of the electronic control means.

It will be appreciated in this regard that the mode of operation of the displacement arrangement of the dispensing control mechanism of the invention is greatly variable, this operation being determined particularly by the configuration of the closure member of a dispensing apparatus to be displaced thereby and particularly the location of the closure member with respect to the dispensing apparatus.

The electronic control means of the dispensing control mechanism of the invention may comprise a programmed logic controller programmed to accommodate operating requirements associated with the operation of the dispensing control mechanism, as determined by the required substance to be dispensed by the dispensing apparatus with which the control mechanism can be operatively associated. The programmed logic controller may be programmed to permit dispensing of a predetermined quantity of substance, either in terms of mass or volume, to be dispensed in response to the nature and characteristics of the substance to be dispensed being identified thereto. More particularly, the electronic control means will determine the time period over which substance must be dispensed by an associated dispensing apparatus for dispensing a predetermined quantity of substance. It will be understood that this time period is greatly variable and is determined also by the nature and characteristics of the substance to be dispensed in terms of viscosity, density, and the like.

The electronic control means particularly includes a keyboard having keys that can be acted upon for determining the required operation of the dispensing apparatus with which the dispensing control means is associated, in use.

The dispensing control mechanism also may include a coin/note feed device interfaced with the electronic control means in a configuration in which feed of a predetermined
money value to the feed device will permit keyboard operation for operation of the electronic control means.

It will be understood that the configuration of the electronic control means is greatly variable and, once again, that this configuration will be particularly determined by the configuration of the dispensing apparatus with which the dispensing control mechanism is to be associated. The electronic control means preferably is housed within a housing that can be mounted on the dispensing apparatus with which the dispensing control mechanism is to be operatively associated, in a configuration in which the keyboard is readily accessible for operation thereof.

The invention extends also to a dispensing apparatus for dispensing a flowable food substance and that includes a dispensing control mechanism, in accordance with the invention, operatively associated therewith for controlling dispensing of the flowable food substance from the dispensing apparatus.

Further features of the dispensing control mechanism of the invention are described hereafter with reference to the accompanying diagrammatic drawing, which illustrates schematically in partially sectioned side view the configuration of a dispensing control mechanism, in accordance with the invention, in an operative configuration thereof with respect to a dispensing apparatus (only partially shown).

Referring to the drawing, a dispensing apparatus having a dispensing control mechanism, in accordance with the invention, mounted thereon, is designated generally by the reference numeral 10. The dispensing apparatus 12 is of the general type provided for dispensing flowable foodstuff substances and for the sake of convenience shall be described hereafter as a dispensing apparatus for dispensing ice cream.

The dispensing apparatus (only partially shown) includes a container part within which ice cream to be dispensed can be contained and from which ice cream can be displaced
by, for example, a screw-type displacement mechanism, through a feed passage 14 to a dispensing nozzle 16. The passage of ice cream through the feed passage 14 is controlled by a closure member 18 which is displaceable in the direction of arrows 20 between a blocking position as shown and an open position in which the passage of ice cream through the feed passage 14 to the nozzle 16 is permitted. The closure member 18 has a coupling formation 22 operatively linked therewith, the coupling formation 22 being a formation with which an operating lever of the dispensing apparatus was operatively connected in a configuration in which displacement of the lever provided for the required displacement of the closure member 18 between its two defined positions. In order to accommodate the dispensing control mechanism of the invention, this operating lever has been disconnected from the coupling formation 22.

The dispensing control mechanism is designated generally by the reference numeral 30 and includes a piston/cylinder mechanism 32 which includes a piston rod 34 that extends from the piston of the mechanism and that is mechanically linked with the coupling formation 22, particularly in a configuration in which operation of the piston/cylinder mechanism 32 can provide for the required displacement of the closure member between its blocking position in which it blocks the feed passage 14 and its open position in which it permits the passage of ice cream through the feed passage.

In the particular example shown, the piston/cylinder mechanism is pneumatically operated and, as such, in use it is connected to a compressed air supply (not shown) via a pressure conduit 36. The conduit 36 is associated with a valve arrangement in line therewith and the operation of which is controlled by an electronic control means enclosed within a housing 38 of the dispensing control mechanism 30, within which the piston/cylinder mechanism 32 also is partially housed.

The electronic control means includes a programmed logic controller associated with suitable control circuitry 40 and electronically linked with a keypad 42 whereby operation of the dispensing control mechanism can be effectively controlled.
The control means particularly provides for a predetermined mass of ice cream to be dispensed, the programmed logic controller particularly being programmed to take into account the specific qualities and characteristics of the ice cream to be dispensed at any particular time. The keypad 42 thus permits the input of information that will determine the mass of ice cream to be dispensed, for example into a cone, a plastics cup, or the like.

The electronic control means clearly controls also the operation of the displacement mechanism whereby ice cream is displaced through the feed pipe 14, operation of this displacement mechanism being effectively synchronized with the displacement of the closure member 18, in order to permit a required mass of ice cream to be accurately dispensed.

The dispensing control mechanism as above described may include also a coin/note feed device 44, which is interfaced with the electronic control means in a configuration in which the feed of a predetermined money value to the feed device is required in order to permit keyboard operation for operation of the electronic control means. The coin/note feed device 44 may be of any conventional type, such devices already been commonly associated with many different dispensing apparatus. By providing the dispensing control mechanism and, as such, a dispensing apparatus with a coin/note feed device as envisaged, the dispensing apparatus can be effectively used as a “self help” apparatus that will permit a person, having fed a predetermined money value to the coin/note feed device, to dispense a required mass of a selected foodstuff substance, by the operation of the keypad of the control means.

It will be understood that within the principles of the invention as above defined and described, dispensing control mechanisms suitable for use with various different types of dispensing apparatus of the type can be provided, the exact configuration of the dispensing control mechanism at any particular time being determined by the dispensing apparatus with which it is proposed to be used. In this regard, programming of the
dispensing control mechanism will be determined by the nature of the substance or liquid to be dispensed, particularly in terms of the mass or volume of substance or liquid to be dispensed in the light of certain pre-identified parameters of the substance or liquid. Clearly, many different parameters can apply in relation to the dispensing of flowable substances and liquids. The configuration of the displacement arrangement whereby dispensing of flowable substances from the associated dispensing apparatus is permitted, will be determined by the configuration of the closure member associated with the apparatus, as well as the required mode of displacement thereof.
CLAIMS

1. A dispensing control mechanism for use with a dispensing apparatus, for dispensing a flowable food substance, which includes a displaceable closure member which, through its displacement between an inoperative position, in which it blocks a feed passage through which a flowable substance must pass to be dispensed, and an operative position, in which a flowable substance can pass through the feed passage, controls dispensing of the flowable substance from the dispensing apparatus via the flow passage, the dispensing control mechanism including

2. A dispensing control mechanism as claimed in Claim 1, in which the displacement arrangement includes a piston/cylinder mechanism that can be mechanically linked with the closure member of a dispensing apparatus in a configuration in which displacement of the piston within the cylinder of the piston/cylinder mechanism will provide for displacement of the closure member between its blocking position and its open position.

3. A dispensing control mechanism as claimed in Claim 2, in which the piston/cylinder mechanism is operatively linked with a coupling formation that is configured to couple the piston/cylinder mechanism with the closure member of a dispensing apparatus.
4. A dispensing control mechanism as claimed in Claim 2 or Claim 3, in which the piston/cylinder mechanism includes connector means for connection to a compressed fluid supply for rendering the piston/cylinder mechanism one of hydraulically and pneumatically operable.

5. A dispensing control mechanism as claimed in Claim 2 or Claim 3, which includes electrically energiseable drive means for operating the piston/cylinder mechanism via operation of the electronic control means.

6. A dispensing control mechanism as claimed in any one of the preceding claims, in which the electronic control means comprises a programmed logic controller programmed to accommodate operating requirements associated with the operation of the dispensing control mechanism, as determined by the required substance to be dispensed by the dispensing apparatus with which the control mechanism can be operatively associated.

7. A dispensing control mechanism as claimed in Claim 6, in which the programmed logic controller is programmed to permit dispensing of a predetermined quantity of substance to be dispensed in response to the nature and characteristics of the substance to be dispensed being identified thereto.

8. A dispensing control mechanism as claimed in Claim 6 or Claim 7, in which the electronic control means determines the time period over which substance must be dispensed by an associated dispensing apparatus for dispensing a predetermined quantity of substance.

9. A dispensing control mechanism as claimed in any one of Claims 6 to 8, in which the electronic control means includes a keyboard having keys that can be acted upon for determining the required operation of the dispensing apparatus with which the dispensing control means is associated, in use.
10. A dispensing control mechanism as claimed in Claim 9, which includes a coin/note feed device interfaced with the electronic control means in a configuration in which feed of a predetermined money value to the feed device will permit keyboard operation for operation of the electronic control means.

11. A dispensing control mechanism as claimed in Claim 9 or Claim 10, in which the electronic control means is housed within a housing that can be mounted on the dispensing apparatus with which the dispensing control mechanism is to be operatively associated, in a configuration in which the keyboard is readily accessible for operation thereof.

12. A dispensing apparatus for dispensing a flowable food substance and including a dispensing control mechanism, as claimed in any one of Claims 1 to 11, operatively associated therewith for controlling dispensing of the flowable food substance from the dispensing apparatus.

13. A dispensing control mechanism for use with a dispensing apparatus, for dispensing a flowable food substance, substantially as described in the specification with reference to and as illustrated in the accompanying drawing.
INTERNATIONAL SEARCH REPORT

INTERNATIONAL APPLICATION NO
PCT/IB2004/002773

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A23G9/28 G07F13/00

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)

IPC 7 A23G G07F

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>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 5 463 878 A (PAREKH SHAFI ET AL) 7 November 1995 (1995-11-07) column 10, line 25 - line 45; figure 7 column 14, line 35 - column 15, line 21 column 18, line 61 - column 19, line 39</td>
<td>1-4, 6, 8, 12</td>
</tr>
<tr>
<td>X</td>
<td>US 6 494 055 B1 (WOHLER JACK D ET AL) 17 December 2002 (2002-12-17) column 17, line 12 - line 54; figures 4, 9</td>
<td>1-3, 5, 8, 12</td>
</tr>
<tr>
<td>Y</td>
<td>US 6 325 250 B1 (FEOULA ANTHONY V) 4 December 2001 (2001-12-04) column 5, line 23 - line 38; figures 8-10 column 6, line 65 - column 7, line 40; claims 1-3</td>
<td>9-11</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of box C. Patent family members are listed in 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 doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

*C* 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

*1* 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 to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

*8* document member of the same patent family

Date of the actual completion of the international search

30 November 2004

Date of mailing of the international search report

08/12/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HJ Noordwijk Tel. (+31-70) 340-2040, Tx. 31 651 epos nl, Facs. (+31-70) 340-3016

Authorized officer

Gaiser, M

Form PCT/ISA/210 (second sheet) (January 2004)
Continuation of Box II.2

Claims Nos.: 13

Claim 13 does not comprise any technical features, but only references to the description. Its subject-matter is thus so unclear that it cannot be searched (Article 6 PCT).

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.
### Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(e) for the following reasons:

1. ☐ Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. ☑ Claims Nos.: 13
   because they relate to parts of the international Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
   see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☑ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.
<table>
<thead>
<tr>
<th>Patent document cited in search report</th>
<th>Publication date</th>
<th>Patent family member(s)</th>
<th>Publication date</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 5463878</td>
<td>A</td>
<td>07-11-1995</td>
<td>NONE</td>
</tr>
<tr>
<td>US 6494055</td>
<td>B1</td>
<td>17-12-2002</td>
<td>AU 4858900 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AU 5031700 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AU 5144900 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AU 5280500 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AU 5867400 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EP 1178734 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EP 1179168 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EP 1178735 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>JP 2003500034 T</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>JP 2003505011 T</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>JP 2003521884 T</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WO 0071959 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WO 0070961 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WO 0071946 A2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WO 0070962 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WO 0070963 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>US 6553779 B1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>US 6490872 B1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>US 5400614 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>US 2002043075 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>US 2003077364 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WO 03042612 A2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>US 2003155031 A1</td>
</tr>
</tbody>
</table>