



(51) International Patent Classification:
G07F 11/00 (2006.01)

(21) International Application Number:
PCT/EP2009/054574

(22) International Filing Date:
17 April 2009 (17.04.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
08154814.1 18 April 2008 (18.04.2008) EP

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: VENDING MACHINE

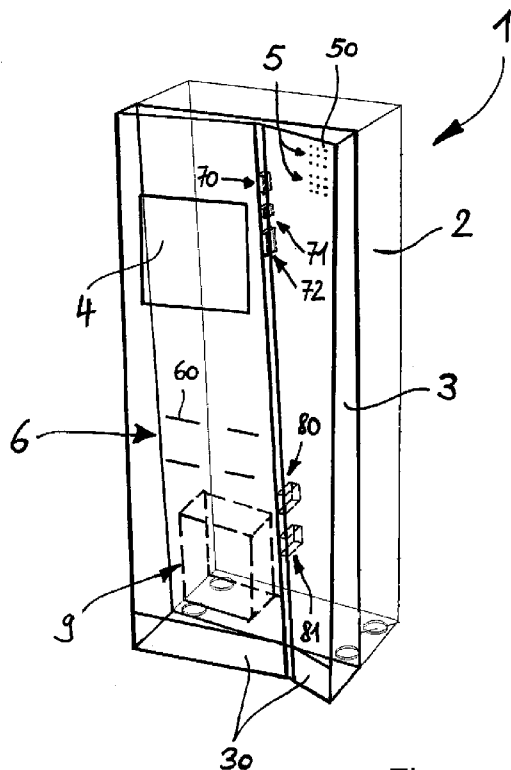


Fig. 1

(57) Abstract: A vending machine, in particular for smoking articles, comprises a housing (1) for storing articles to be vended, at least one input port (70,71,72) for insertion of payment means, selecting means for choosing an article to be purchased, and at least one output port (80) for providing the purchased article. The housing comprises a front face (3) having a user interface comprising interface means, in particular a touchscreen (4), and display means (5,50) for displaying predefined images on the front face (3).



GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR),

OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

- 1 -

Vending Machine

The present invention relates to a vending machine, in particular a vending machine for smoking articles. Vending machines are widely used for various consumer goods including beverages, food, cosmetic articles and smoking articles, such as cigarettes. Conventional vending machines typically comprise an input port for the insertion of suitable payment means, a plurality of pushbuttons, keys and pull-out-drawers or push-out means for choosing and retrieving the article to be purchased. Once an article has been selected and paid for, the article is provided at an output port of the machine.

Purchasing an article using a conventional vending machine is not an interesting event or a pleasurable experience. Consumers often prefer to purchase the article at a store, kiosk or other location rather than use a vending machine. There is a need for new and improved vending machines which are more attractive and more convenient for use by consumers. The present invention provides a vending machine comprising a housing for storing the articles to be vended, at least one input port for insertion of payment means, selecting means for choosing an article to be purchased, and at least one output port for providing the purchased article. The housing comprises a front face having a user interface comprising interface means, preferably a touch screen, and display means for displaying predefined images.

The display means are capable of displaying predefined images in particular on the front face of the machine. The display means advantageously elicit consumer interest , for

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example by serving as an eye-catcher and may motivate the consumer to approach and use the vending machine. Advantageously, the display means provides visual attractiveness and encourages the consumer to purchase an article offered by the vending machine. The touchscreen of the user interface of the vending machine further increases the attractiveness of the vending machine.

The touchscreen is a user-friendly and convenient means for the consumer to communicate with the vending machine, for example for selecting an article to be purchased. A touchscreen allows the simultaneous display of different articles in an attractive manner and possible selection by the consumer touching the screen with his finger. The simplicity of the communication with the machine may assist the consumer in making his "buy-decision". The user interface provides a very flexible way of changing not only which kind of products will be displayed and vended, but also the complete software in order to modify the interaction with the consumer to meet his needs, or the need of the vendor. Preferably, this is changed easily without changing any hardware components of the machine. The at least one input port of the vending machine according to the invention may comprise one or more suitable slots for insertion of the respective payment means, such as coins, bank notes (bills) or suitable payment cards. Suitable payment cards include, for example, credit cards or cash cards. The output port advantageously comprises a slot or push-out means which provides the selected article in a way that it can be easily retrieved by the consumer.

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The vending machine provided by the present invention is suitable for many goods and articles, in particular small-sized or 'everyday items, that many consumers may desire to buy on a frequent basis and to be readily available.

In a preferred aspect, the present invention provides a vending machine for smoking articles. The term "smoking articles" is meant to comprise any type of smoking article, including, but not limited to, cigarettes with or without filters, flavored cigarettes, such as menthol cigarettes cigarillos and cigars. The smoking articles may be provided in a rigid pack, a soft pack, in a wrapped bundle (serving as "refill packs"), or any other type of package suitable for sale in vending machines. The vending machines for smoking articles as provided by the present invention are advantageous in that they offer enhanced visual attractiveness and convenience to the adult smoker.

The touchscreen comprises a screen or surface on which images can be displayed for presentation or selection. In the selection mode, the touchscreen allows a consumer to select one of the displayed options by touching the screen at the location where the desired option is displayed. Also, the touchscreen may display information about the action presently performed by the vending machine, or it may display information prompting the user to perform a specific action by touching the screen at a location on the touchscreen where a desired option is displayed.

The term "display means" denotes any means suitable for displaying one or more images, on the front face of the vending machine. The term "images" includes any type of characteristic visual representation of a vended article enabling its

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unambiguous identification by the consumer, such as, for example, images, symbols, brands, trademarks, logos, pictograms, numbers, letters or words, parts or combinations thereof. The display means may be capable of switching between an active state and a stand-by state. Advantageously, the display means comprises light emitting diodes (LEDs) in the form of an LED-matrix. The LED-matrix comprises various LED-matrix elements which are arranged in a predetermined manner behind the front face of the vending machine. The front face of the machine may, for example, be made of security glass, or of suitable plastic materials. The term "LED-matrix element" denotes an element comprising a predetermined number of LEDs being arranged within a predetermined spatial area in a predetermined manner. A plurality of such LED-matrix elements may be arranged in a predetermined pattern, for example in columns and rows, behind the front face of the vending machine, thus forming the LED-matrix. It is thus possible to control the LED-matrix elements such that some or even all LED-matrix elements may display one symbol, e.g. a brand, trademark or one or more parts thereof. Alternatively, the LED-matrix elements may be controlled in a manner such that one group of LED-matrix elements displays one image while at the same time another group of LED-matrix elements displays another image. Also, during operation of the vending machine, the display means may display information as to the action that is presently performed by the machine, or it may prompt the consumer to perform a specific action. For example, the area around the at least one input port may be illuminated to indicate that the consumer is to insert payment means into that input port, and at

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the same time the user may be prompted to insert a suitable payment means by displaying a respective message on the front face. The same principle may analogously apply to the output port. When the purchased article is provided at the output port of the vending machine, the output port may be illuminated while the user is prompted to take the purchased article by displaying a respective message on the front face.

In one embodiment of the vending machine according to the invention, the user interface and the display means cover a range of 50%-100% of the front face, in particular 70%-90% of the front face. This provides for sufficient space for both the user interface and the display means.

In a further embodiment of the vending machine according to the invention, the front face of the housing comprises a front door, and the display means are arranged within the front door so that front door and display means together form an integral component. This embodiment is particularly advantageous from a constructional point of view, since a standard back housing of a conventional vending machine may be used in combination with such a front door. This allows use of standard well-working technology combined with a modern and attractive front door.

A further embodiment of the vending machine according to the invention comprises at least one movement detector for detecting a user approaching the machine. Such a movement detector is particularly advantageous in an embodiment in which the display means are capable of switching between an active state and a stand-by state. By way of example, the movement detector may rely on low energy microwave technology, but any

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other suitable technology may be used alternatively or in addition. Displaying attractive images in the stand-by state of the machine where no potential consumers are present in a predetermined spatial area around or in front of the vending machine may help to attract potential consumers from a greater distance. As the movement detector detects the movement of a potential consumer in the predetermined spatial area around or in front of the vending machine, it causes the display means to switch to an active state in which the display means display images which may make use of the vending machine even more attractive and exciting to the potential consumer, for example by raising his curiosity. For example, the displayed images may become larger as the consumer further approaches the vending machine.

A further embodiment of the vending machine according to the invention additionally comprises authorization means for verifying that the user is authorized to use the machine and purchase the articles in the machine. This is particularly advantageous for a vending machine for smoking articles (but not limited thereto) for which identification of the user as an adult is desired or legally required. Such authorization means may also be advantageous, for example, in vending machines offering beverages containing alcohol, or other articles for which authorization, for example based on age, is desired or required. At the time authorization is to be performed, for example by the user's insertion of an identification card (ID) in the form of a smart card, the display means may prompt the user to perform this action while at the same time illuminating the respective input

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port where the user is to insert the ID. Authorization may also be realized by a fingerprint detector.

A further embodiment of the vending machine according to the invention additionally comprises a control unit for controlling operation of the vending machine. Such a control unit, which may be a computer or a similar means, coordinates the various actions and activates and controls the respective components of the vending machine so that the vending machine works properly. For example, the computer may control activation/stand-by of the display means, it may control the display means in the above-described manner, or it may control all actions performed in the interior of the vending machine so that they are properly executed.

In a still further embodiment of the vending machine according to the invention, the at least one input port comprises a first input slot for insertion of a payment card, a second input slot for insertion of coins, and a third slot for the input of notes, while the at least one output port comprises a first output slot for providing the purchased item and for the return of coins, and a second output slot for the return of notes. This embodiment is particularly advantageous since the user may choose between coins, bills or a payment card such as a credit card as payment means, whichever is most convenient to him. This may additionally encourage the consumer to purchase the article, since each of the afore-mentioned payment means is accepted. The vending machine may also accept other payment methods including wireless methods such as paying by mobile.

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In yet a further embodiment of the vending machine according to the invention, the front face comprises a predetermined area that is reserved for displaying a health warning. This embodiment is also advantageous, since in some countries it is prescribed by law that such health warning is always visible at the respective vending machines, particularly when the articles offered are smoking articles.

In still a further embodiment of the vending machine according to the invention the display means is a LED matrix, which is known both as a technically reliable and attractive display means.

Further advantageous aspects of the present invention are evident from the following more detailed description of a particularly preferred embodiment of a vending machine according to the invention. To illustrate the present invention the Figure shows a schematic representation of one embodiment of a vending machine according to the invention in a perspective view. The illustrated vending machine is particularly suitable for cigarettes.

The vending machine shown in the Figure comprises a housing 1 that comprises a back housing 2 and a front door 3 which is pivotably attached to back housing 2 at the left hand side of the back housing 2, so that front door 3 can be opened and closed in order to access the interior of the vending machine. Front door 3 forms the front face of housing 1 and may be made or partially made of breaksafe glass or other suitable materials such as plastics.

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Front door 3 comprises a touchscreen 4 and display means in the form of a plurality of LED-matrix elements 5, which may be arranged in rows and columns. For the sake of simplicity of the drawing, only two such LED-matrix elements 5 are indicated exaggeratedly large. Generally LED-matrix elements 5 can be arranged more or less over the entire surface of front door 3 except for specific areas which will be discussed further below. The number of single LEDs 50 of one single LED-matrix element 5 has been chosen to be 9 for the sake of simplicity of the drawing. However, this choice is arbitrary and by way of example only, and the number of single LEDs may be substantially higher than nine. For the sake of maintenance and security, the special touchscreen is, in this embodiment, mounted completely behind the glass or plastic surface. This means that the front surface has no gaps or seams, which is advantageous for ease of production of the glass. Furthermore, the user is not able to contact the touchscreen directly.

Also, the vending machine comprises a movement detector 6 comprising four microwave detector elements 60. The number of detector elements 60 is again chosen by way of example only and for the sake of simplicity of the drawing. Alternatively, any other suitable movement detector may be used.

The vending machine shown in the Figure further comprises three input slots, a first input slot 70 for insertion of smart cards such as credit cards, cash cards or ID cards, a second input slot 71 for insertion of coins, and a third input slot 72 for insertion of notes. In addition, the shown embodiment of the vending machine comprises two output slots, a first output slot

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80 for the output of the chosen article and for the return of coins and a second output slot 81 for the return of bills. In addition, the vending machine may comprise separate output slots for the purchased article and for the return of coins, so that in total the machine may comprise three separate output slots. However, the machine in the embodiment shown, only has two such output slots. For the sake of alternative payment methods, or different consumer demands and preferences, the middle slot is prepared to have different input/output slots, or additional means such as a fingerprint detector.

The vending machine further comprises a control unit in form of a computer 9 which is arranged in back housing 2 of the vending machine. Computer 9 controls the various components and operations of the vending machine which will be described in more detail below.

Finally, a reserved area 30 may be provided at the lower end of front door 3 where a health warning may be displayed. In case such a health warning is legally required in a particular country, area 30 is not available for displaying anything other than the health warning.

The following description illustrates one possible way of how the vending machine may work under full control of computer 9. However, many variations are readily conceivable by the person skilled in the art which are included within the scope of the present invention. According to this example, the vending machine has remained idle for a considerable period of time. It is in its stand-by state in which a few images are displayed on front door 3 so as to attract potential consumers from afar. At the time a

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potential consumer approaches the vending machine and enters a predetermined area around or in front of the vending machine, movement detector 6 detects movements of the potential consumer and switches the display means from its stand-by state to an active state.

In this active state, the various LED-matrix elements 5 may display on front door 3 a welcome message, together with some attractive images which are characteristic of the offered brands, or which are suitable to attract the attention of the potential buyer. Also, illumination of some essential components such as illumination of input slots 70,71,72 or of output slots 80,81 may be active in order to visually emphasize that purchasing the article is very easy and convenient. At minimum, the attention of the consumer is to be attracted. This can be performed, for example, by increasing the size of the images displayed on front door 3 as the user continues to approach the vending machine, which is detected by movement detector 6. In reserved area 30, the required health warning may be displayed.

As the consumer is standing in front of the vending machine which is again detected by the movement detector 6, essentially no images are displayed on front door 3, except that the consumer is prompted to authorize himself, for example as having the required minimum age. This prompting can be supported by a suitable message displayed on front door 3 with the aid of LED-matrix elements 5 and at the same time by illuminating first input port 70, so that the consumer readily realizes that he is to insert his ID into first input port 70. Once the authorization has been checked, a suitable message may be displayed on front

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door 3 so as to indicate to the consumer that authorization is accepted and valid, or has failed. Depending on the nature of failure, the consumer may be prompted to perform authorization anew (for example in case the ID could not be properly read), or a message may be displayed on front door 3 indicating to the consumer that he does not fulfil the required criteria, such as the legal minimum age, and the process is terminated.

Once authorization has been successfully completed, different options of how to further proceed are displayed on touchscreen 4. For example an area may be displayed where the phrase "touch to buy" appears and another area may be displayed where the phrase "touch to discover" appears. The consumer is thus prompted to either touch the "buy" area in case he has already made his "buy-decision", or to touch the "discover" area in case he wants to obtain more information.

As the user touches the "discover" area, he may be guided through various presentations or image trailers related to the respective products. In the case of cigarettes such presentations or image trailers may provide information concerning the various available brands, the available flavours, the various available types of packages, and the like. Browsing through the various available brands, flavours or types of packages can be performed in a manner similar to that described below with respect to the buy-process.

As the consumer touches the "buy" area, he will be prompted to choose the desired brand and flavor. For that purpose, the various brands and flavours may be displayed on touchscreen 4. A message is displayed on touchscreen 4 indicating to the consumer

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that he may browse through the various available brands and flavours by moving his hand in front of touchscreen 4, and the brands and flavours are scrolled through in accordance with the movement of the consumer's hand. The respective brand and flavour which is presently centered on touchscreen 4 is animated and the corresponding name and price are displayed. If a specific brand and flavour is sold out and is therefore not available at that time, a respective message is displayed either on touchscreen 4 or on front door 3 with the aid of the LED-matrix elements 5.

At any time, the consumer may switch to the "discover" function in order to get more information about the respective brand and flavour which is presently centered on touchscreen 4. For that reason, there is a respective "discover" area displayed on touchscreen 4 which can be selected by the consumer through touching the said area. An image trailer or additional information related to the respective brand and flavour which is presently centered on touchscreen 4 may then be shown on touchscreen 4.

By touching a "buy" area displayed on touchscreen 4 or by touching the respective brand and flavour presently centered, the consumer may return to the buying process where he is then prompted to pay. At that time, the first input slot 70, the second input slot 71, and the third input slot 72 are illuminated and beside the respective slot a respective term such as "card", "coins" and "notes" can be displayed on front door 3 with the aid of LED-matrix elements 5.

After the user has either inserted a payment card such as a credit card or cash card into first input slot 70, or has

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inserted the required amount of money by inserting coins into second input slot 71, or by inserting notes into third input slot 72, illumination of the first, second and third input slots 70, 71, 72 is terminated and the cigarette package of the selected brand and flavour is provided by the vending machine at first output slot 80. To indicate that to the consumer, first output slot 80 is illuminated, and a corresponding message may be displayed on front door 3 with the aid of LED-matrix elements 5. The consumer is then to take the cigarette package of the selected brand and flavour from output slot 80.

In case the amount of money has been overpaid, if money is to be returned in form of notes, the second output slot 81 is illuminated. If money is to be returned in form of coins, first output slot 80 remains illuminated after the consumer has taken the cigarette package. A suitable message such as "money return" may be displayed with the aid of LED-matrix elements 5 on front door 3 close to first and second output slots 80 or 81, respectively.

After completion of these actions, a "thank you" or "enjoy" message may be displayed on front door 3 with the aid of LED-matrix elements 5, and the user may choose to buy another package of cigarettes in the manner described above. After a predetermined period of time of no movement, for example fifteen seconds, movement detector 6 may cause the display means to switch to the stand-by state.

Many modifications and variations of the exemplary embodiment of the vending machine described above are readily conceivable without departing from the teaching of the present

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invention. Thus the above description of one embodiment is not intended to limit the scope of the present invention, but rather the scope of protection is defined by the appended claims.

Claims

1. Vending machine, in particular for smoking articles, comprising a housing (1) for storing articles to be vended, at least one input port (70,71,72) for insertion of payment means, selecting means for choosing an article to be purchased, and at least one output port (80) for providing the purchased article, wherein the housing comprises a front face (3), wherein the front face (3) comprises a user interface comprising interface means, in particular a touchscreen (4), and wherein the front face (3) further comprises outside of the user interface a display means (5,50) for displaying predefined images on the front face (3).
2. Vending machine according to claim 1, wherein the user interface and the display means cover a range of 50%-100% of the front face (3), in particular 70%-90% of the front face.
3. Vending machine according to claim 1 or claim 2, wherein the front face of the housing (1) comprises a front door (3), and wherein the display means (5) are arranged within the front door (3) so that front door (3) and display means (5) together form an integral component.
4. Vending machine according to any one of claims 1 to 3, further comprising at least one movement detector (6,60) for detecting a user approaching the machine.
5. Vending machine according to claim 4, wherein the display means (5) are capable of switching between an active state

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and a stand-by state, and wherein the at least one movement detector (6) is capable of causing the display means (5) to switch to the active state upon detection of the movement of a user approaching the machine.

6. Vending machine according to any one of the preceding claims, further comprising authorization means (70) for verification of the authorization of a user.
7. Vending machine according to any one of the preceding claims, further comprising a control unit (9) for controlling operation of the vending machine.
8. Vending machine according to any one of the preceding claims, wherein the at least one inlet port comprises a first input slot (70) for insertion of a payment card, a second input slot (71) for insertion of coins, and a third input slot (72) for the input of bills, and wherein the at least one outlet port comprises a first output slot (80) for providing the purchased article and for the return of coins and a second output slot (81) for the return of bills.
9. Vending machine according to any one of the preceding claims, wherein the front face (3) comprises a predetermined area (30) that is reserved for displaying a health warning.
10. Vending machine according to any one of the preceding claims, wherein the display means (5,50) is a LED matrix.

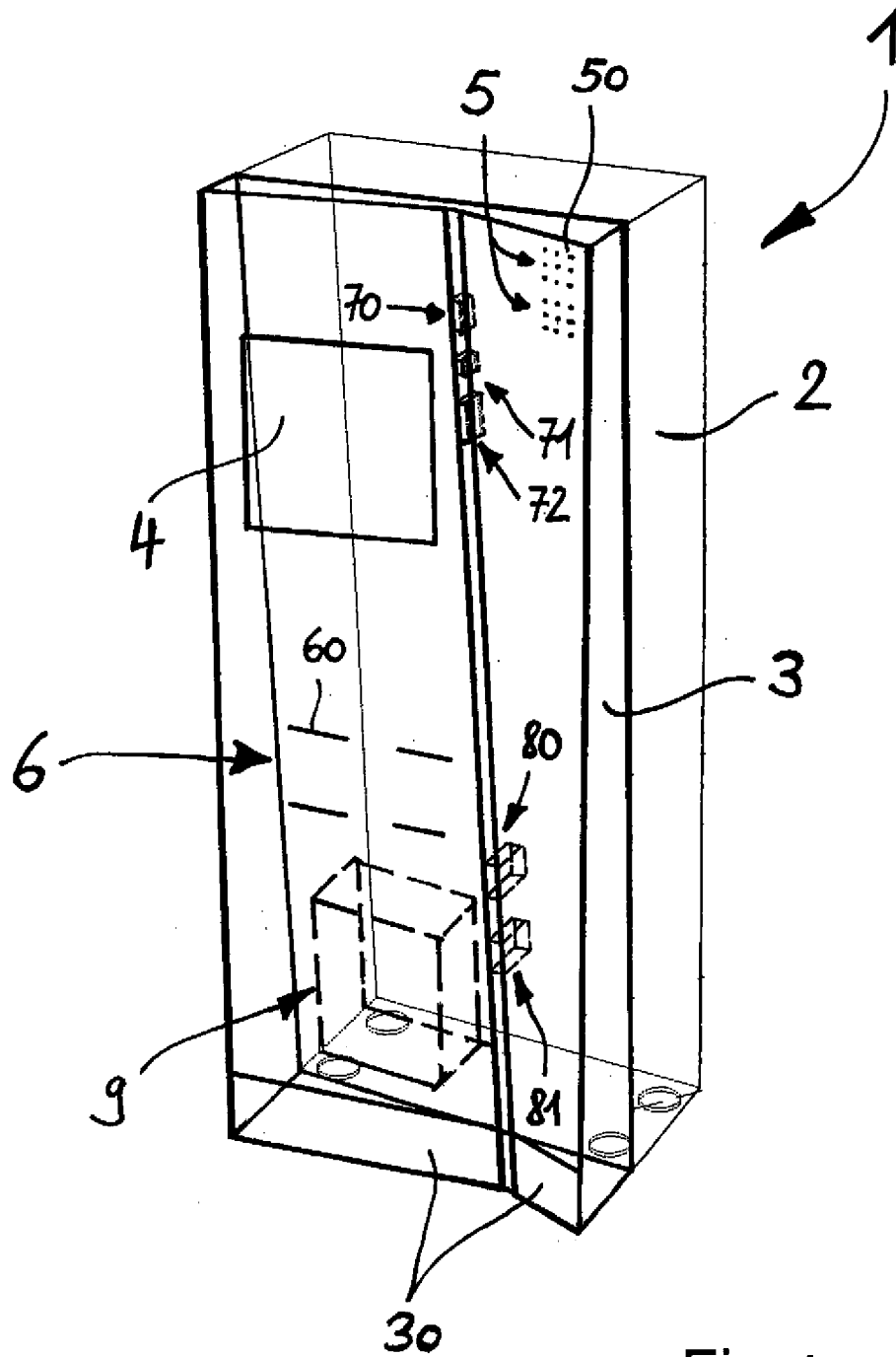


Fig. 1

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/054574

A. CLASSIFICATION OF SUBJECT MATTER
INV. G07F11/00

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)
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

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X	JP 11 232537 A (JAPAN TOBACCO INC) 27 August 1999 (1999-08-27) abstract paragraph [0011] - paragraph [0021] ----- -/--	1-10

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search

5 June 2009

Date of mailing of the international search report

19/06/2009

Name and mailing address of the ISA/

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Lavin Liermo, Jesus

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2009/054574

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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Information on patent family members

International application No

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