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(54) Title: FULLY AUTOMATIC SMART COFFEE MACHINE AND WORKING METHOD

(57) Abstract: The present invention relates to a full automatic smart coffee machine and working method, which is generally developed to provide customers with customizable options in smart coffee vending machines the user selects the coffee with a ready content (18) defined in the system via a vending machine (1) or selects the content (18) ratios he/she wants and defines a hot beverage (5) that he/she has prepared himself or a cold beverage (8) prepared by himself/herself through the system, entering a graphic (19) and/or a text (20) data that users want to engrave on the surface of their coffee cups (12), processing of these entered data by a cloud computing system (13), processing graphic (19) and/or text (20) data on the relevant cup (12) surface by the laser integrated into the vending machine, beverage requested by the user is added to the processed cup (12) and given to the user from the delivery door of the vending machine, or if the user requests it, the processed product is sent to a different user's application account via a gift module (11), user defined to the system as a result of the administrator's approval, such as the operating status of the vending machine, the stock level of the materials, the milk temperature, the hot water temperature, etc. and/or to the shareholders (15).



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FULLY AUTOMATIC SMART COFFEE MACHINE AND WORKING METHOD

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Technical Field:

The present invention relates to a fully automatic smart coffee machine and working method, which is generally developed to provide customers with customizable options in smart coffee vending machines.

10

State of the Art:

There are many different types of automatic coffee vending machines for coffee making, which is one of the most popular beverage types today.

15

These machines typically offer pre-packaged coffee products that are brewed and dispensed automatically. Some may offer limited customization options like choosing coffee strength or adding milk/sugar. Traditional coffee vending machines often provide limited options and lack customization features. There are smart coffee machines available that offer customization options and remote-control features. These machines often have touch screens, mobile app integration, and the ability to adjust parameters like coffee strength, temperature, and cup size. They may also offer options for different coffee blends and milk-based beverages. Some coffee machines in the market leverage IoT technology for remote monitoring, inventory management, and maintenance purposes. These machines may have sensors that provide data on coffee bean levels, brewing temperature, and machine performance.

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Open-mouthed glass, cup, etc. products served in traditional open top coffee machines pose a risk in terms of hygiene standards, but also adversely affect the quality of the coffee. In addition, traditional vending machines typically accept only cash or limited payment methods.

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In the patent application numbered GR1004367, “Mobile (Portable) Self-Acting (Automated) Coffee-Grinding and Vending Machine” is described. It is disclosed herein a self-acting coffee-grounding and -vending machine. It is a coin-feed machine supplying
5 freshly-ground or -crushed coffee bins of any type (French coffee, espresso, cappuccino, Greek coffee and cocoa) and allowing the combination of different types of coffee (blend selection). By means of a computer, the foregoing machine is actuated -whenever desired-upon use of the user's identification code.

10 In the current technique discussed above, pre-packaged coffee products are automatically brewed and presented to the user. However, the present invention lacks a mechanism to address the hygiene concerns associated with conventional open top coffee machines. For this reason, the beverage offered carries the risk of contamination and the cleanliness and quality of the coffee served is doubted. At the same time, customizable options such as
15 special laser engraving on cups, multiple payment methods, integration with mobile application, machine learning and the use of IoT sensors are not mentioned, which will distinguish this invention from traditional coffee vending machines.

In the patent application numbered CN108428293, “Multifunctional Intelligent Coffee
20 Machine” is described. Multifunctional smart coffee machine; a coffee machine with a receiver module, a control module, an iBeacon module and a client side. client side; It includes a flavor adjustment module, a payment module and a road navigation module.

Although it is mentioned above that the current technique provides customizable options
25 such as individual customization of taste, there is no device configuration with high functionality until it reaches the bean to the glass in a fully autonomous manner. Apart from this, the current technique does not include the integration of structural technical features such as multi-payment method, machine learning and IoT sensors, use of personalized laser processing method on cups. In addition, the lack of a closed lid system
30 configuration to ensure that the coffee served is served in accordance with hygienic conditions is a deficiency in the current art.

As a result, it can overcome the aforementioned disadvantages and provide efficient, artificial intelligence-based, real-time data that can be easily and accessible, customizable, comply with hygiene standards, prevent the risk of contamination, provide different payment options, have a simple user interface, and optimize transactions, there
5 is a need for a new technology that offers working and timely maintenance and improves the consumer and producer experience.

Description of the Invention:

10 This invention is a fully automatic smart coffee vending machine and its working method, and it's characterized by; Allows users to customize their coffee according to their preferences, has a user-friendly interface, is easy and accessible, can be customized, complies with hygiene standards, prevents the risk of contamination, provides different payment options, has a simple user interface, is effective, artificial intelligence-based,
15 optimizes transactions, it is a new technology that provides efficient operation and timely maintenance by providing real-time data and improves the consumer and producer experience.

The invention offers a convenient solution for coffee lovers who want to enjoy a freshly
20 brewed cup of coffee without the need for manual preparation or visiting a coffee shop. It eliminates the time and effort required to grind beans, brew coffee, and handle various ingredients, making coffee more accessible in various settings.

This invention allows users to customize their coffee according to their personal
25 preferences. Users can shape their coffee experiences according to their own special tastes with different coffee blends and milk beverage options.

The machine offers multiple ways for users to interact with it, either through a mobile application or an in-built touch screen. This intuitive and user-friendly interface enhances
30 the overall user experience, making it easy for customers to place orders, customize their coffee, and process payments.

The Smart Coffee vending machine offers a user-friendly interface, enabling easy interaction and navigation for customers. This is achieved through either a mobile application or an in-built touch screen, providing intuitive control and display options. The structural characteristics supporting this advantage include the integration of
5 touchscreen displays, user interface design principles, and software development for seamless interaction.

The advantages of the device subject to the invention are as follows:

10 Coffee Vending: The primary purpose of the invention is to provide a convenient and automated solution for coffee vending. It offers a bean to cup experience, meaning the machine grinds fresh coffee beans and prepares a customized cup of coffee using milk-based ingredients. This feature caters to coffee lovers who appreciate the taste and aroma of freshly brewed coffee.

15 Customization: The machine allows users to customize their coffee according to their preferences. By offering options for milk-based beverages and the ability to choose from different coffee bean blends, users can enjoy a personalized coffee experience tailored to their taste. The machine allows users to customize their coffee based on personal
20 preferences. By offering a range of choices for coffee blends and milk-based beverages, it caters to individual taste preferences. This customization feature is achieved through the machine's structure, which includes separate compartments for different coffee blends and ingredients, as well as adjustable settings that can be selected by the user.

25 Closed Lid and Custom Laser Engraved Cup: The machine incorporates a closed lid system, ensuring hygiene and preventing contamination. Additionally, it provides custom laser engraving on the cup, adding a unique and personalized touch to the coffee drinking experience. The closed lid system of the Smart Coffee vending machine addresses hygiene concerns associated with traditional open-top coffee machines. By sealing the
30 cup, the machine minimizes the risk of contamination, ensuring the cleanliness and quality of the coffee being served. The closed lid feature is an inherent structural characteristic that prevents external elements from entering the coffee cup during the

preparation process.

5 Multiple Payment Methods: The Smart Coffee vending machine supports various payment methods, including credit card payments, cup points (possibly a loyalty program), mobile payments, and even cryptocurrency. This versatility allows users to conveniently and flexibly choose their preferred payment method. This versatility allows users to conveniently choose their preferred payment method.

10 Mobile Application Integration: The machine can be used in conjunction with a mobile application, enabling users to interact with the machine remotely. This integration offers features such as pre-ordering, payment options, and customization settings that can be accessed through the mobile app.

15 In-Built Touch Screen: Alternatively, users can directly interact with the machine through its in-built touch screen. This feature provides a user-friendly interface for ordering, customizing, and processing payments.

20 Machine Learning and IoT Sensors: The Smart Coffee vending machine utilizes machine learning algorithms and Internet of Things (IoT) sensors to automate and optimize its operations. Machine learning enables the machine to learn user preferences over time, making personalized recommendations and improving the overall coffee brewing process. IoT sensors provide real-time data on inventory levels, machine maintenance, and performance, ensuring efficient operation and timely maintenance.

25 The invention leverages machine learning and IoT sensors to optimize operations and improve the coffee vending experience. Machine learning algorithms learn user preferences over time, enabling personalized recommendations. IoT sensors provide real-time data on inventory levels, machine maintenance, and performance, ensuring efficient operation and timely maintenance.

30

The purpose of development of the device subject to the invention is as follows:

Convenience: The invention aims to provide a convenient and efficient way for people to enjoy freshly brewed coffee on the go. By automating the coffee brewing process and incorporating customizable options, the machine offers a quick and hassle-free experience, eliminating the need for manual coffee preparation.

- 5 Convenience and Time Efficiency: The Smart Coffee vending machine provides a convenient solution for coffee lovers by automating the coffee brewing process. Users can simply place an order and receive a freshly brewed cup of coffee without the need for manual preparation or visiting a coffee shop. This convenience is made possible by the machine's fully automatic functionality and the integration of bean-to-cup technology,
10 which grinds fresh coffee beans and prepares the coffee on demand.

Personalization: The goal might be to cater to individual preferences by allowing users to customize their coffee. By offering a range of options, such as different coffee bean blends and milk-based beverages, the machine provides a personalized coffee experience to satisfy diverse tastes.

- 15 Hygiene and Quality: The inclusion of a closed lid system in the machine addresses concerns related to hygiene and ensures that the coffee remains uncontaminated. Maintaining quality in the coffee preparation process could be a crucial objective, aiming to deliver consistently high-quality and flavorful coffee.

- Innovation and Technology Integration: Developing a Smart Coffee vending machine
20 with advanced features like multiple payment methods, mobile application integration, and machine learning showcases the integration of cutting-edge technologies. The goal here could be to offer a modern, seamless, and technologically advanced coffee vending solution.

- Technological Advancements: The machine incorporates machine learning algorithms
25 and IoT sensors, which optimize operations and enhance the overall coffee vending experience. The machine learning algorithms analyze user preferences over time and make personalized recommendations, while the IoT sensors provide real-time data on inventory levels, machine maintenance, and performance. These technological advancements are integrated into the machine's structure through the inclusion of data
30 collection sensors, processing units, and connectivity capabilities.

Customer Experience and Satisfaction: Enhancing the overall customer experience and satisfaction is likely a key goal. By providing a range of features and options, as well as a user-friendly interface, the invention aims to deliver an enjoyable and memorable coffee drinking experience for customers.

- 5 Business Opportunities: Developing an innovative coffee vending machine with unique features opens up potential business opportunities. The goal might be to tap into the coffee market and establish partnerships with coffee brands, workplaces, universities, or public spaces, where the machine could be deployed to generate revenue and attract customers.
- 10 The structural and characteristic features and all advantages of the product subject to the invention will be understood more clearly thanks to the figures given below and the detailed explanation written by making reference to these figures, and therefore the evaluation should be made by taking these figures and detailed explanation into consideration.

15

Description of the Figures:

- The invention will be described with reference to the accompanying figures, so that the features of the invention will be more clearly understood and appreciated, but the purpose
- 20 of this is not to limit the invention to these certain regulations. On the contrary, it is intended to cover all alternatives, changes and equivalences that can be included in the area of the invention defined by the accompanying claims. The details shown should be understood that they are shown only for the purpose of describing the preferred embodiments of the present invention and are presented in order to provide the most
- 25 convenient and easily understandable description of both the shaping of methods and the rules and conceptual features of the invention. In these drawings;

- Figure 1 A schematic view of the application interface of the vending machine subjected in the invention.
- 30 Figure 2 A schematic view of the application interface of the vending machine subjected in the invention.

- Figure 3 A schematic view of the application interface of the vending machine subjected in the invention.
- Figure 4 A schematic view of the application interface of the vending machine subjected in the invention.
- 5 Figure 5 A schematic view of the working principle of the automaton subjected in the invention.

The figures to help understand the present invention are numbered as indicated in the attached image and are given below along with their names.

10

Description of References:

1. Username
2. Account Data
- 15 3. Screen
4. Hot Drink
5. The user Prepared Hot Drink
6. Open / Close Button
7. Cold Drink
- 20 8. The Cold Drink He Had Prepared
9. Menu
10. Location
11. Gift Module
12. Cup
- 25 13. Cloud Computing System
14. User
15. Shareholder
16. Internet Connected Board
17. Electronics Board
- 30 18. Content
19. Graphic
20. Text

- 21. Approval Module
- 22. Selection of Payment Method
- 23. QR Code

5 Detailed Description of The Invention:

The operation of the basic elements that make up the system that is the subject of the invention are as follows:

- 10 User interface: designed to receive user inputs such as coffee beverage selection, payment method, graphics/text for engrave on the cup (12). In addition, the user can manage their account data (2), see the nearest machine's locations (10), and share their cups with third parties via the gift module (11).
- 15 Cloud computing: Cloud computing system (13) transmits data to users (14), machine and shareholders (15). In addition, data related to user-to-user interaction such as payment, graphic processing and gift sharing are also processed by the cloud computing system (13). The machine business operation environment is optimized by the cloud computing system (13).
- 20 Machine: Its function is to prepare a coffee cup (12) and deliver it to the user by the included internet connected board (16) and electronics board (17). It also provides transaction data to shareholders (15) for monitoring and optimization purposes.

The process steps of the inventive system are as follows:

- 25 Step 1: drink selection:
The user views the quick menu (9) from the downloaded mobile application or from the touch screen (3) on the machine. The user can choose the hot drink (4) or cold drink (7) he/she wants, or he/she can have the user prepare hot drink or the cold drink he had prepared (8) prepared by himself/herself, by choosing the content (18) ratios of his/her own beverage. After making the selection, the user can optionally upload user inputs such as graphics (19) / text (20) for engrave to be engraved on the cup (12) to the system to engrave the cup (12), and then select the final menu (9) in the approval
- 30

module (21) can be verified by The next step is the selection of payment method (22) where the user opens the phone's camera and scans the QR code (23) on the machine. If the touch screen (3) is used on the machine, this step is skipped.

5 Step 2: order processing:

From the previous step, the order data packets are sent to the cloud computing system (13) for processing. The system contacts third-party payment service providers to verify the payment. Then, the cloud computing system (13) processes the design parameters of the coffee cup (12) in a format that the machine can understand. The system can also
10 process gift sharing or trophy transfer directly from user to user. After processing the order, it sends execution commands to the internet connected board (16) of the machine. The machine uses these instructions and the electronics board (17) to prepare the coffee cup (12). This includes preparing the beverage and processing the cup, closing the lid and delivering the cup through the automatic dispensing door. At the end of this
15 process, the user is informed that the closed coffee cup is ready to be taken. After the cup is taken, the door is closed to end the service.

Step 3: monitoring and operation optimization:

The machines use a set of iot sensors internally to monitor the working status, stock level of materials, milk temperature, hot water temperature. Live status is periodically
20 reported to the cloud system accessible to shareholders. If for any reason the milk temperature rises above the safe level for a long time, the machine is automatically deactivated or has the feature of removing milk-based drinks from the menu (9).

Machine running status is used in conjunction with machine learning tools to automatically invoke maintenance tasks in a specific geographic area, relocate or
25 suggest menu (9) changes.

CLAIMS

- 1- The invention is related to the fully automatic smart coffee vending machine and its working method, **and it's characterized by;**
- 5 - the user selects the coffee with a ready content (18) defined in the system via a vending machine (1) or selects the content (18) ratios he/she wants and defines a hot beverage (5) that he/she has prepared himself or a cold beverage (8) prepared by himself/herself through the system,
- 10 - entering a graphic (19) and/or a text (20) data that users want to engrave on the surface of their coffee cups (12),
- processing of these entered data by a cloud computing system (13),
- processing graphic (19) and/or text (20) data on the relevant cup (12) surface by the laser integrated into the vending machine,
- 15 - beverage requested by the user is added to the processed cup (12) and given to the user from the delivery door of the vending machine, or if the user requests it, the processed product is sent to a different user's application account via a gift module (11),
- 20 - user defined to the system as a result of the administrator's approval, such as the operating status of the vending machine, the stock level of the materials, the milk temperature, the hot water temperature, etc. and/or to the shareholders (15).
- 2- As mentioned in Claim 1, it is a fully automatic smart coffee vending machine and its working method, and it's characterized by; the fact that all data processed
- 25 by a cloud computing system (13) are periodically reported and transmitted to a user (14) and/or a shareholder (15).
- 3- As mentioned in Claim 1, it is a fully automatic smart coffee vending machine and its working method, and it's characterized by; the fact that if the temperature
- 30 of the milk and the waiting time from the refrigerator in the vending machine exceed the safe level by the Iot sensor integrated into the system, this situation is communicated to the user (14) and/or shareholders (15).

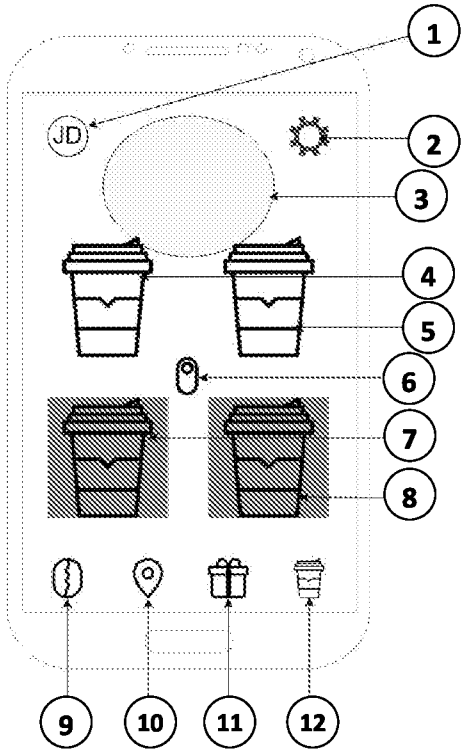


Figure-1

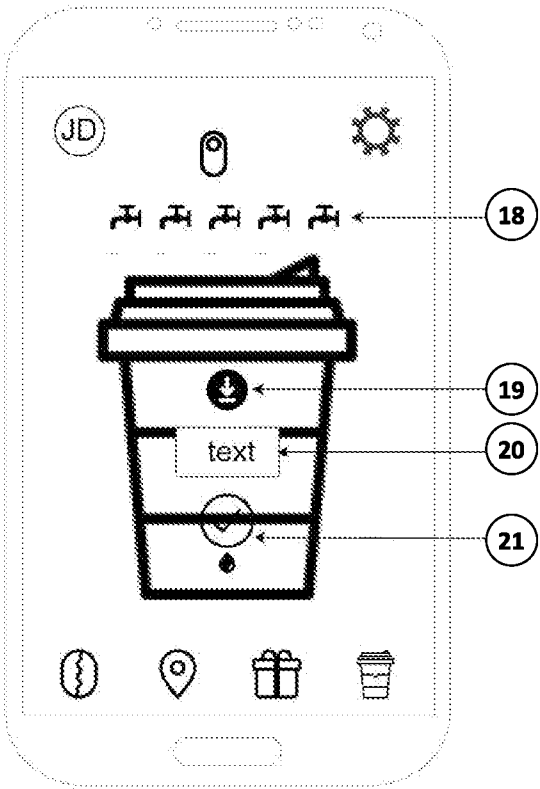


Figure-2

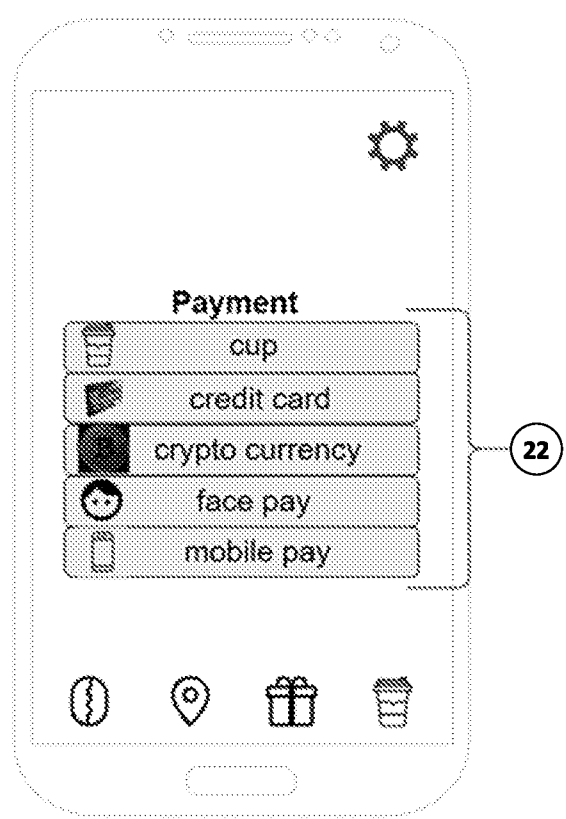


Figure-3

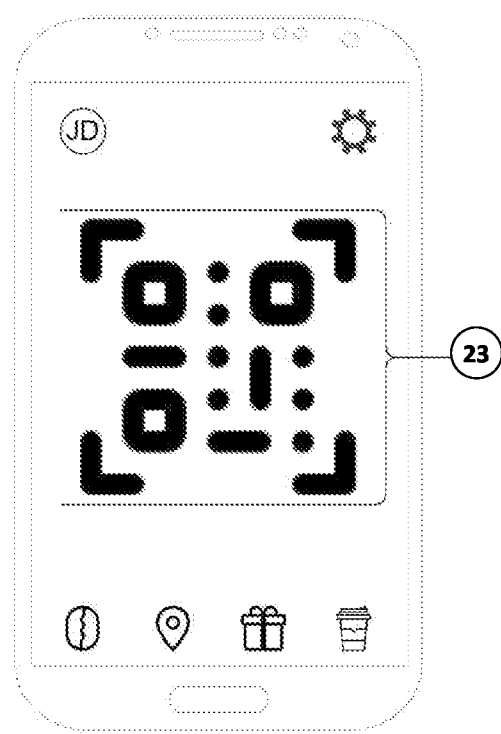


Figure-4

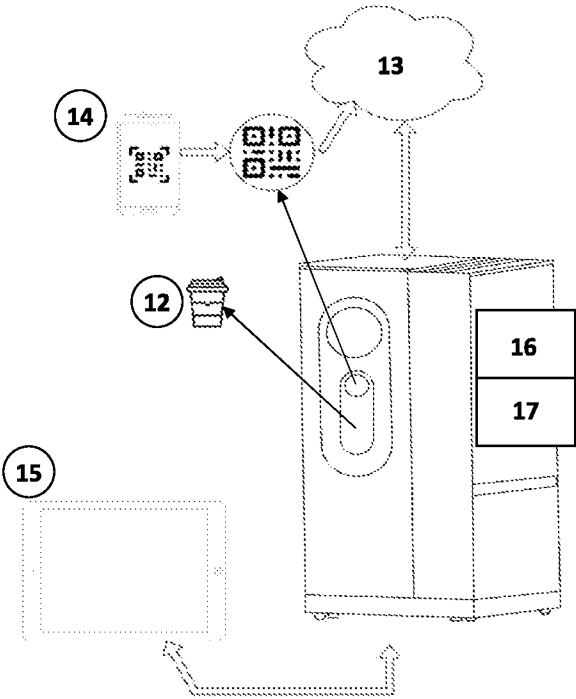


Figure-5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/TR2023/050525

A. CLASSIFICATION OF SUBJECT MATTER

G07F 13/06 (2006.01)i; G06Q 20/14 (2012.01)i

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 13/06; G06Q 20/14

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

TURKPATENT Patent Databases

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

EPO Abstract and Fulltext Databases, keywords: coffee, beverage, machine, kiosk, vending, cup, engrave, laser, cloud, gift, deliver, door, administrator

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2013087050 A1 (BRIGGO INC [US]) 11 April 2013 (2013-04-11) par 28-55, 114, 139-141, 155-164, figures 22, 23	1-3
A	WO 2017144580 A1 (NESTEC SA [CH]) 31 August 2017 (2017-08-31) Whole document	1-3
A	WO 2015184669 A1 (TOP ELECTRIC APPLIANCES IND [CN]) 10 December 2015 (2015-12-10) Whole document	1-3



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

“D” document cited by the applicant in the international application

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“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 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

“&” document member of the same patent family

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/TR2023/050525

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
US	2013087050	A1	11 April 2013	WO	2013055938	A1	18 April 2013
WO	2017144580	A1	31 August 2017	AR	107693	A1	23 May 2018
				TW	201741203	A	01 December 2017
WO	2015184669	A1	10 December 2015	NONE			