

SYSTEM AND METHOD FOR CREATING DIGITIZED AROMA

TECHNICAL FIELD

5 The present disclosure relates to a real-time, interactive collaboration system for
aroma creation. More particularly, the present disclosure relates to a real-time interactive
system to digitize aroma. Even more particularly, the present disclosure relates to
techniques, methods, systems and mechanisms for recording or capturing the
multisensorial process of aroma creation.

10 BACKGROUND

Traditional aroma creation and presentation has typically been carried out using
scent bottles, test subjects and/or olfactometers. However, as companies become more
global and work schedules more flexible, flavorists and perfumers working together on
projects using an aroma blending device are not always located in the same place as each
15 other or in the same place as the aroma blending device. Add in the complexity of also
working together with global customers and scheduling creation sessions and consumer
studies becomes increasingly difficult.

Accordingly, when creating aromas there is a need for the ability to digitize the
aroma, share, collaborate and interact in real-time using near field communication devices
20 and the internet.

SUMMARY

In one embodiment, a real-time interactive collaboration system for aroma
creation is provided. The system includes an aroma blending device adapted to deliver at
25 least one aroma substance to the nasal cavities of a consumer; a plurality of aroma
substance containing cartridges including a communication means for data
communication between the cartridges and the aroma blending device; a web enabled
device that stores a computer application; and a cloud server that stores information
related to an aroma creation session. The web enabled device is in communication with
30 the cloud server and the aroma blending device.

In another embodiment, a plurality of aroma substance containing cartridges for
use with an aroma blending device is provided. The plurality of cartridges include a

reservoir for each cartridge, each reservoir containing an aroma substance and inlet and outlet channels to permit ingress of a carrier gas into the reservoir and egress of aroma substance containing carrier gas from the reservoir; and a near field communication (NFC) tag that is configured with information associated with the cartridges. The
5 cartridges communicate with the aroma blending device using NFC.

These and other features, aspects and advantages of specific embodiments will become evident to those skilled in the art from a reading of the present disclosure.

10 BRIEF DESCRIPTION OF THE DRAWINGS

The embodiments set forth in the drawings are illustrative in nature and not intended to limit the invention defined by the claims. The following detailed description of the illustrative embodiments can be understood when read in conjunction with the following drawings, where like structure is indicated with like reference numerals and in
15 which:

FIG. 1 depicts a real-time interactive collaboration system for aroma creation according to embodiments shown and described herein;

FIG. 2a depicts a schematic perspective view of a support body containing a plurality of cartridges within the support body according to embodiments shown and
20 described herein;

FIG. 2b depicts a schematic perspective view of a support body containing a plurality of cartridges within the support body according to embodiments shown and described herein; and

FIG. 3 depicts a record session feature of a real-time interactive collaboration
25 system for aroma creation according to embodiments shown and described herein.

The embodiments set forth in the drawings are illustrative in nature and not intended to be limiting of the disclosure defined by the claims. Moreover, individual features of the drawings and disclosure will be more fully apparent and understood in view of the detailed description.

30

DETAILED DESCRIPTION

The following text sets forth a broad description of numerous different embodiments of the present disclosure. The description is to be construed as exemplary only and does not describe every possible embodiment since describing every possible embodiment would be impractical, if not impossible. It will be understood that any feature, characteristic, component, composition, ingredient, product, step or methodology described herein can be deleted, combined with or substituted for, in whole or part, any other feature, characteristic, component, composition, ingredient, product, step or methodology described herein. Numerous alternative embodiments could be implemented, using either current technology or technology developed after the filing date of this patent, which would still fall within the scope of the claims. All publications and patents cited herein are incorporated herein by reference.

The present disclosure describes various embodiments of a real-time interactive collaboration system 10 for sharing an aroma creation session between users. The system 10 enables users to share, collaborate and interact in real-time. The users may be physically collocated in the same venue, such as, for example, a conference room or lab, or located remotely. In one embodiment, such a system 10 includes an aroma blending device 20; a plurality of aroma substance containing cartridges 30; a web enabled device 40 that stores a computer algorithm and a cloud server 50 that stores session information.

Turning to FIG. 1, is an illustration of a near field communication (NFC) interface enabled aroma blending device 20 communicating with the NFC sticker(s) 35 attached to the aroma substance containing cartridges 30 and the web enabled device 40 in accordance with one embodiment of the present disclosure. In one embodiment, web enabled device 40 is also communicating with the cloud server 50 over the internet.

In accordance with one embodiment, the aroma blending device 20 may include the following elements (not all elements are shown): a source of carrier gas flow; a regulating means which receives the carrier gas flow and regulates its passage through a plurality of channels; downstream of the regulating means, a plurality of aroma substance containing cartridges 30, one being associated with each channel; and a disseminating means adapted to deliver at least one aroma substance to the nasal cavities of a consumer.

In one embodiment, the aroma blending device 20 may be an olfactometer device (an instrument capable of exactly dosing a portion of a gaseous phase which is present due to the vapor pressure of a sample or in the form of a liquid or a solid) for example the Virtual Aroma Synthesizer® device or MiniVAS™ device, both developed and owned by
5 Givaudan.

The source of carrier gas may be any suitable source of gas. For example, the carrier gas may be air or nitrogen, and the source may be a compressor. Alternatively, the source may be a pressurized cylinder of gas. The gas flow is conveyed to a regulating means. The regulating means is typically a device that comprises a plurality of channels
10 adapted to convey the gas to cartridges 30 containing aroma substance, one cartridge per channel. Thus, by opening and closing channels and maintaining these openings and closings for predetermined times, the regulating means can determine which aroma substances and how much thereof are conveyed and when, and thus alter the nature of the aroma perceived by a user.

The operation of the regulating means may be remote, for example, by computer either wired to the regulating device or operating it wirelessly. In one embodiment, the aroma blending device 20 includes a short range communication reader for short range communication. Non-limiting examples of short range communication include, Bluetooth, radio frequency identification (RFID), infrared data association (IrDA), ultra
20 wideband (UWB), ZigBee, or any number of other wireless communication protocols or interfaces. In one embodiment, the aroma blending device includes a NFC interface. The NFC interface may have a range of approximately about 4 inches to about 8 inches. The close range communication with the NFC interface may take place via magnetic field induction 60, allowing the NFC interface to communicate with other NFC device or to
25 retrieve information from an NFC sticker(s) 35 located on the plurality of cartridges 30 as explained in more detail below.

In accordance with another embodiment, the aroma blending device 20 may have a display 25. Display may function as a touch screen through which a user may interact with the aroma blending device 20.

30 The cartridges 30 of aroma substance from which the desired aroma is created may be any suitable cartridge capable of containing the desired aroma substances and releasing them when impinged upon by a carrier gas. One particular type is a cartridge 30

comprising a reservoir containing an aroma substance and being provided with inlet and outlet channels to permit ingress of carrier gas into the reservoir and egress of aroma substance-containing carrier gas from the reservoir, the channels being defined by capillaries having internal diameter and length dimensions sufficient to act as closure

5 means to prevent, or substantially prevent, leakage of aroma substance from the reservoir into a head space external of the cartridge when carrier gas flow is interrupted. Such a cartridge is described in U.S. Patent 7,601,297, incorporated herein by reference in its entirety. It has the advantages that it can be small and very slim (about credit card-sized) and that it need no valve arrangements, merely a supply of carrier gas to entrain the

10 substance from the cartridge and means of directing and regulating this. Such cartridges are easily replaced when empty. FIG. 2a shows a credit-card design 100 for a support body in perspective containing a plurality of cartridges 30 or rack. In another embodiment, FIG. 2b shows a generally cylindrical support body 110 containing a plurality of cartridges 30 or rack. In one embodiment, a rack consists of any number of

15 individual cartridges including, for example, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 or more cartridges. In some embodiments, the rack of cartridges includes at least five individual cartridges; in another embodiment at least 10 individual cartridges; in another embodiment at least fifteen individual cartridges. In another embodiment, the aroma blending device may include more than 1 rack of cartridges, for example at least 2 or 3

20 racks of cartridges, for the possibility of a total of 30 or 45 individual cartridges loaded into the aroma blending device 20.

The aroma substances that are entrained by the gas flow from the cartridges are conveyed by the carrier to a disseminating means via a conduit. The nature of the disseminating means may be any disseminating means capable of delivering a vapour-

25 phase substance to the nasal cavities of an individual. For example, it may be a small nose piece able to be worn, or it may be a sniffing port connected to the aroma blending device.

Each plurality or rack of cartridges 30 would have a pre-programmed, unique NFC sticker or tag 35 that is configured with a predetermined identifier for security and

30 for storing data associated with one or more operating parameters of the cartridges. Once the rack of cartridges 30 is inserted into the aroma blending device 20 and the identifier is validated, the aroma blending device 20 is activated. In one embodiment, without the

validation of the NFC sticker 35, the aroma blending device 20 would not be operational. This ensures that only authenticate and valid cartridges 30 can be used with the aroma blending device 20. In another embodiment, the validation of the NFC sticker 35 is optional.

5 In one embodiment, the type of information that is stored on the NFC sticker 35 and subsequently retrieved by the aroma blending device 20 includes a security code or identifier that is unique to the rack of cartridges 30 that it is attached. Other information that is stored on the NFC sticker 35 includes an expiration date for the rack and specific ingredient information for each cartridge (for example, which aroma chemicals are loaded
10 in the cartridge), date and time stamp information or if the amount of data is too large, a link to a cloud server in order to retrieve the aroma substance information. During use, additional information may be stored on the NFC stickers 35 including usage information, for example, amount of air flow or flow-rate, duration of usage, expiry date of cartridges 30.

15 In accordance with the present disclosure, the system 10 may also include a web enabled device 40 in order to access the Internet. As used herein, the term web enabled device 40 refers to any portable device capable of running one or more software applications and also can be connected to the Internet or one or more computer networks. Web enabled devices 40 include, but are not limited to, personal computers, laptop
20 computers, smartphones (for example, iPhone or Android), tablets, netbooks, GPS devices, e-readers, iPads, smart TV's and mobile game consoles (for example, Nintendo DS, Sony PSP). In accordance with one embodiment, the web enabled device 40 is in communication with the cloud server 50 and the aroma blending device 20.

 The web enabled device 40 may include at least one central processing unit
25 (CPU). The CPU may provide processing capability to execute an operating system, run various applications, and/or provide processing for one or more of the techniques described herein. Applications may include, for example, software for blending of the aroma substances. An example of such software is Aroma Composer™ Software developed by Givaudan Flavors Corporation of Cincinnati, Ohio. The Aroma
30 Composer™ Software controls the ratios and intensities of the ingredient samples or aroma substances delivered to the sniffing port for evaluation by a consumer. In another embodiment, software that uses data science and predictive analytics to analyze data

collected from consumers is included. An example of such software is ATOM™ Software developed by Givaudan Flavors Corporation of Cincinnati, Ohio.

A main memory may be communicably coupled to the CPU, which may store data and executable code. The main memory may represent volatile memory such as RAM,
5 but may also include nonvolatile memory, such as read-only memory (ROM) or Flash memory. In buffering or caching data related to operations of the CPU, the main memory may store data associated with applications running on the web enabled device 40.

The web enabled device 40 may also include nonvolatile storage. The nonvolatile
10 storage may represent any suitable nonvolatile storage medium, such as a hard disk drive or nonvolatile memory, such as Flash memory. Being well-suited to long-term storage, the nonvolatile storage may store data files.

One or more network interfaces may exist on the web enabled device for network connectivity. The network interface may be any network including, but not limited to, a
15 telephone network or a computer network (e.g., the internet, a local area network, a wide area network, and/or wireless network such as a cellular network, a Wi-Fi network according to Institute of Electrical and Electronics Engineers (IEEE) standards 802.11a/b or g or other such wireless local area network standards, or a WiMax network according to IEEE standard 802.16 or another such wireless broadband standard). In another
20 embodiment, the web enabled device 40 includes a Bluetooth communication interface 70 and a microphone to capture audio.

In accordance with the present disclosure, the system 10 may also include a cloud server 50 for storing information related to an aroma creation session, for example, aroma substance specific information. A cloud server 50 is a logical server that is built, hosted
25 and delivered through a cloud computing platform over the Internet 80. Cloud servers 50 possess and exhibit similar capabilities and functionality to a typical server but are accessed remotely from a cloud service provider. In other words, cloud servers 50 can be configured to provide levels of performance, security and control similar to those of a dedicated server. But instead of being hosted on physical hardware that's solely used by
30 you, they reside in a shared "virtualized" environment that's managed by your cloud hosting provider. According to one embodiment, cloud server 50 includes

memory and a processor. The memory stores information, for example, ingredient information and session information, while the processor updates the NFC sticker 35.

In one embodiment, the communication between the web enabled device 40 and the cloud server 50 and the web enabled device 40 and the aroma blending device 20 enables a platform for users to share key learnings. Additionally, this communication enables a unique record session feature which allows users to capture and replay the process of aroma substance creation in a multisensorial dimension (aroma, audio and screen capture). For example, this feature may be used to record the proposed aroma substance created by a flavorist(s), the reaction and feedback of a customer(s) 220, the real-time changes to the aroma substance made by the flavorist(s) in response to input and feedback of a customer and to bookmark important aroma substances during the creation process to allow a user to jump to that specific point in time during playback of a session. In another embodiment, the real-time, interactive collaboration system 10 may include multiple aroma blending devices 20 and multiple web enabled devices 40 (in different locations networked together) through the internet 80. This would allow users located in remote locations to experience the same aroma profile during for example, a creation or working session.

With reference to FIG. 3, features allowing the system 10 to record a session in real-time are further described. In one embodiment, the web enabled device 40 contains software, for example, Aroma Composer™ software that controls the aroma blending device 20. In another embodiment, the software also has the ability to record both audio feedback via a microphone in the web enabled device 40 and session data (collectively “session recording”). For example, the audio feedback is recorded and saved via audio or data files 200, for example, an audio file and the session data such as mouse clicks, flow rates, time increments, or bookmarks, are saved in one embodiment as a data file such as a Java Script Object Notation (JSON) file. In one embodiment, the session recording does not contain any ingredient specific information about what aroma substances are loaded in the cartridges. Rather, the aroma substance specific information may be stored on the cloud server 50 via a session file. In one embodiment, each session recording is linked to a session file.

Presently, NFC stickers 35 can only hold a relatively small amount of data (KB size). As technology improves and NFC stickers 35 are capable of holding data of several

MB size, the need to have a cloud server to store session files will be eliminated. Rather, all of the session files and session recording data will be able to be stored on the NFC sticker 35.

In the broadest sense, the present disclosure describes a system that for capturing
5 the digital signature of an aroma, storing it digitally and retrieving it on demand, i.e. technology for digitizing aroma. The digitized form of aroma can be stored digitally, transmitted to users via email and other digital means, and reproduced via the web enabled device 40 and the aroma blending device 20. For example, a flavor or fragrance formulation is stored on cloud server 50 as data; the data is sent to the web enabled device
10 40 having software for analyzing the formulation(s); and then the web enabled device 40 communicates with the aroma blending device 20 in order to convert the formulation into an aroma profile for users to smell with corresponding cartridge 30. When users or consumers identify an aroma profile using the aroma blending device 20 with certain cartridges 25, the aroma profile can be converted into a formula that can be stored in a
15 cloud server 50.

In another embodiment, the communication between the web enabled device 40 and the cloud server 50 and the web enabled device 40 and the aroma blending device 20 may enable consumers to experience aromas corresponding to pictures or videos as part of a presentation, for example a PowerPoint® presentation. In one embodiment, as part
20 of a real-time, interactive aroma creation session, an individual may present a presentation via the web enabled device 40. According to the present disclosure, as the presentation moves from slide to slide showing different pictures or videos, for example a picture of an orange on one slide and a picture of a watermelon on a second slide, the system can be configured such that the aroma blending device 20 creates aromas or aroma
25 blends matching the pictures on the slides for the viewers of the presentation to smell.

The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as “40 mm”
30 is intended to mean “about 40 mm”.

Every document cited herein, including any cross referenced or related patent or application, is hereby incorporated herein by reference in its entirety unless expressly

excluded or otherwise limited. The citation of any document is not an admission that it is prior art with respect to any invention disclosed or claimed herein or that it alone, or in any combination with any other reference or references, teaches, suggests or discloses any such invention. Further, to the extent that any meaning or definition of a term in this document conflicts with any meaning or definition of the same term in a document incorporated by reference, the meaning or definition assigned to that term in this document shall govern.

While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the spirit and scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

15

20

25

30

WHAT IS CLAIMED IS:

1. A real-time interactive collaboration system for aroma creation, comprising:
an aroma blending device adapted to deliver at least one aroma substance to the
5 nasal cavities of a consumer;
a plurality of aroma substance containing cartridges including a communication
means for data communication between the cartridges and the aroma blending device; and
a web enabled device that stores a computer application; and
a cloud server that stores information related to the aroma creation session;
10 wherein the web enabled device is in communication with the cloud server and the
aroma blending device.
2. The system according to claim 1, wherein the aroma blending device includes a
display.
15
3. The system according to claim 2, wherein the display is a touch screen.
4. The system according to claim 1, wherein the web enabled device includes a
microphone.
20
5. The system according to claim 1, wherein the communication means includes a
short range communication reader.
6. The system according to claim 5, wherein the communication means includes a
25 near field communication (NFC) interface.
7. The system according to claim 1, wherein the information on the cloud server
includes aroma substance information for each cartridge.
- 30 8. The system according to claim 7, wherein the aroma substance information is
selected from the group consisting of security code, ingredient information, date and time
stamp, expiry date, air flow through cartridges and duration of usage for cartridges.

9. The system according to claim 1, wherein the computer application includes a record session feature for recording the aroma creation session.

10. The system according to claim 1, wherein the plurality of aroma substance
5 containing cartridges includes at least 10 cartridges.

11. The system according to claim 1, wherein the plurality of aroma substance containing cartridges includes at least 15 cartridges

10 12. A plurality of aroma substance containing cartridges for use with an aroma blending device, the plurality of cartridges comprising:

a reservoir for each cartridge, each reservoir containing an aroma substance and inlet and outlet channels to permit ingress of a carrier gas into the reservoir and egress of aroma substance containing carrier gas from the reservoir; and

15 a near field communication (NFC) tag that is configured with information associated with the cartridges wherein the cartridges communicate with the aroma blending device using near field communication (NFC).

13. The plurality of cartridges according to claim 12, wherein the information
20 associated with the cartridges is a predetermined identifier.

14. The plurality of cartridges according to claim 13, wherein the predetermined identifier is a security code.

25 15. The plurality of cartridges according to claim 12, wherein the information associated with the cartridges is data comprising one or more operating parameters of the cartridges.

30