

EUROPEAN QUALIFYING EXAMINATION 2013

Paper B(E/M)

Electricity / Mechanics

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Description of the Application

[001] The present invention relates to a closure for a beverage container. The beverage container is typically a bottle and the beverage is, for example, wine or whisky.

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[002] During the maturing process of wine and whisky, particles break down slowly into smaller particles. In the presence of oxygen this breakdown releases molecules which give aged wines and whiskys their particular flavours. In the 9th century AD, monks found that the sound of religious music accelerated the maturing process of bottled wine.

10 Sound consists of mechanical vibration waves in the frequency range of 0.02 to 20kHz. Sound waves accelerate the breakdown of particles in an alcoholic beverage and therefore accelerate the maturing process.

[003] The invention concerns closures for accelerating the maturing process of a beverage. The invention also includes a system comprising closures as defined in the claims in combination with a bottle comprising a base having an internal parabolic surface.

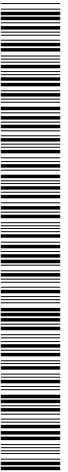
[004] Brief description of the drawings.

20 Fig. 1 shows an arrangement for applying sound to a beverage with a closure according to a first embodiment of the invention.

Fig. 2 shows part of a wine bottle and a closure according to a second embodiment of the invention.

25 Fig. 3 shows a wine bottle and a closure according to a third embodiment of the invention.

The invention will now be described with reference to the drawings.



[005] Fig. 1 shows a beverage container 1, a closure 10, a signal generator 12 and a cable 14 with a plug 19. The beverage container 1 comprises an air inlet 7. The beverage container contains an alcoholic beverage 2 and is closed by the closure 10. The closure according to the first embodiment comprises a body 3 made of wood, a socket terminal 9, and a vibrator unit 4. The signal generator 12 is connected to the vibrator unit 4 via the cable 14, the plug 19 and the socket terminal 9. The signal generator 12 is arranged to generate an electrical signal. The vibrator unit 4 comprises a flat vibrator plate 42 and a piezoelectric vibrator 41 which transforms the electrical signal into sound waves 5. The sound waves 5 propagate in the beverage and accelerate the maturing process of the beverage 2.

[006] The development of specific flavours in the beverage, such as tobacco and berry flavours, can be accelerated by exposing the beverage to sound waves at different specific frequencies promoting generation of these flavours. The piezoelectric vibrator 41 generates sound waves at these different frequencies. Known miniature loudspeakers use such piezoelectric vibrators because they are smaller than other electromechanical vibrators and because they can convert electrical signals into sound waves over a wide frequency range.

[007] Fig. 2 shows a closure 20 according to the second embodiment of the invention. The closure comprises a cylindrical shaped body 13 made of cork. The socket terminal 9 is an audio socket terminal having a diameter of 3mm. The socket terminal 9 is sufficiently narrow for a corkscrew to be inserted into the body 13. The vibrator unit 4 is the same as the vibrator unit in the first embodiment.



5 [008] The cylindrical body 13 comprises an air channel 17 connecting the inside of the container to the outside of the container. The air channel 17 serves as an inlet for oxygen, which is essential for the maturing process. The air channel 17 also accommodates an electric conductor 8 which electrically connects the socket terminal 9 to the piezoelectric vibrator 41. The vibrator unit 4 also acts as a valve for opening and closing the air channel 17 when it vibrates. When no electrical signal is applied to the piezoelectric vibrator 41, the plate 42 keeps the air channel 17 closed.

10 [009] Fig. 3 shows, in a bottle 21, a closure 30 according to the third embodiment of the invention. The body 23 is made of a non-porous synthetic polymer, for example polyethylene or polyurethane. The electric conductor 8 is embedded in the material of the body 23. The vibrator unit 4 comprises a piezoelectric vibrator 41 and a vibrator plate 43. The vibrator plate 43 has a parabolic surface for directing sound waves 25 towards the centre of the bottle.

15 [010] The bottle 21 comprises a base 15 having an internal parabolic surface 16. The parabolic surface 16 of the base 15 is arranged to reflect sound waves 25 towards a focal point 18 close to the base 15, where particles tend to collect.

20 [011] The closures according to the second and third embodiments can be used both in the winery and by the consumer. They remain in the bottles until the wine is to be consumed. Where closures according to the invention are used with a container comprising its own air inlet, closures do not need to have an air channel. Where the beverage container does not comprise an air inlet, it is essential that the closure
25 comprises an air channel.



Claims

1. Closure (10, 20, 30) for a beverage container (1, 21), the closure being arranged for accelerating the maturing process of a beverage (2), the closure comprising a body (3, 13, 23), a vibrator unit (4) for generating sound waves (5) in the beverage (2), an air channel (17), and means (8, 9) for conducting electrical signals to the vibrator unit (4).
2. Closure according to claim 1, wherein the body (3, 13, 23) is made of wood, cork or a synthetic polymer.
3. Closure according to any previous claim, wherein the vibrator unit (4) comprises a piezoelectric vibrator (41) for generating the sound waves at different frequencies.
4. Closure according to claim 3 comprising a vibrator plate (43) having a parabolic surface.



Drawings of the Application

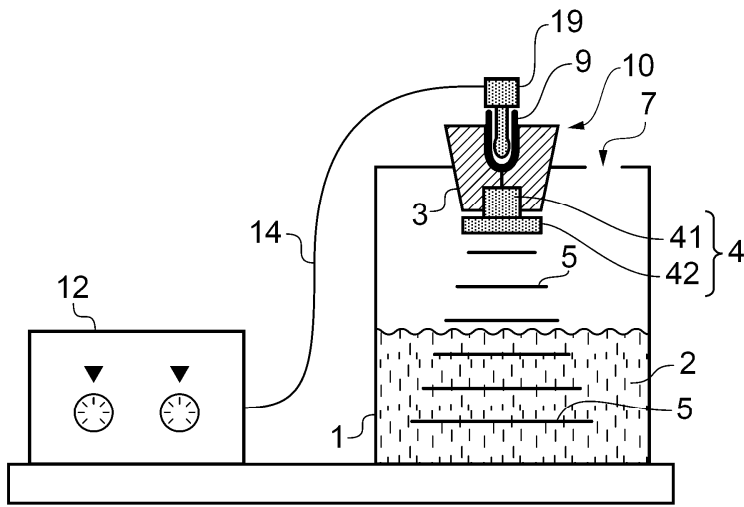


FIG. 1

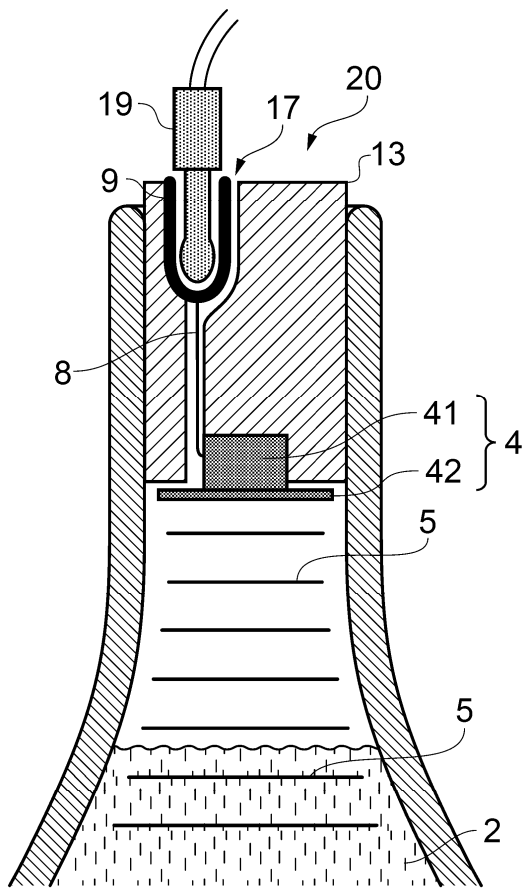


FIG. 2

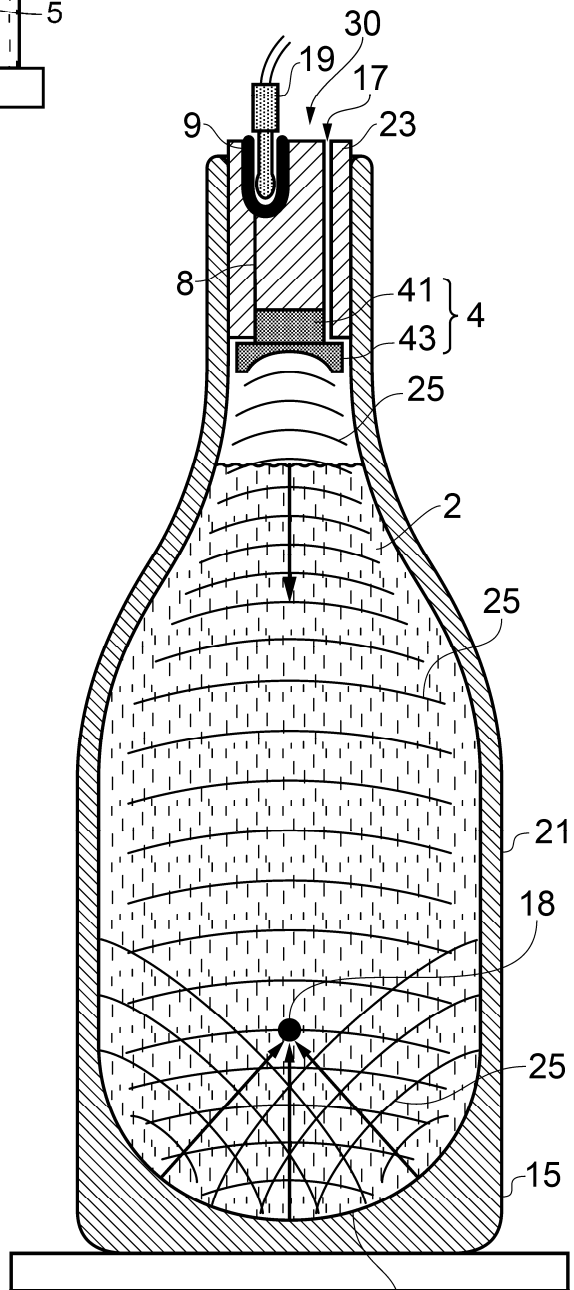


FIG. 3



Communication

1. This communication is based on the application as originally filed. Documents D1 and D2 are prior art according to Art. 54(2) EPC.
2. The subject matter of claims 1 and 2 is not new within the meaning of Art. 54(1) and (2) EPC, because it is known from D1:
 - 2.1 D1 discloses a closure (100) for a beverage container (101), the closure being arranged for accelerating the maturing process of a beverage (102), the closure comprising a body (103), a vibrator unit (tuning fork 104 vibrates at frequencies in the sound range and is therefore a vibrator unit) for generating sound waves (105) in the beverage, an air channel (107) and means (108) for conducting electrical signals to the vibrator unit (rod 108 is made of metal and is therefore suitable for conducting electrical signals to the vibrator unit 104).
 - 2.2 D1 also discloses that the body (103) of the closure is made of cork.
3. Regarding the subject matter of claim 3, it is noted that the use of piezoelectric vibrators for generating sound waves in wine bottles is known from document D2.
4. Claim 4 claims a closure having a vibrator plate (43) in addition to a vibrator unit (4). However, the description only discloses a vibrator plate (43) as being part of a vibrator unit (4) (see par. [009]). Claim 4 is therefore not supported by the description as required by Art. 84 EPC.
5. A new independent claim to be filed should be in the two-part form in accordance with Rule 43(1) EPC.



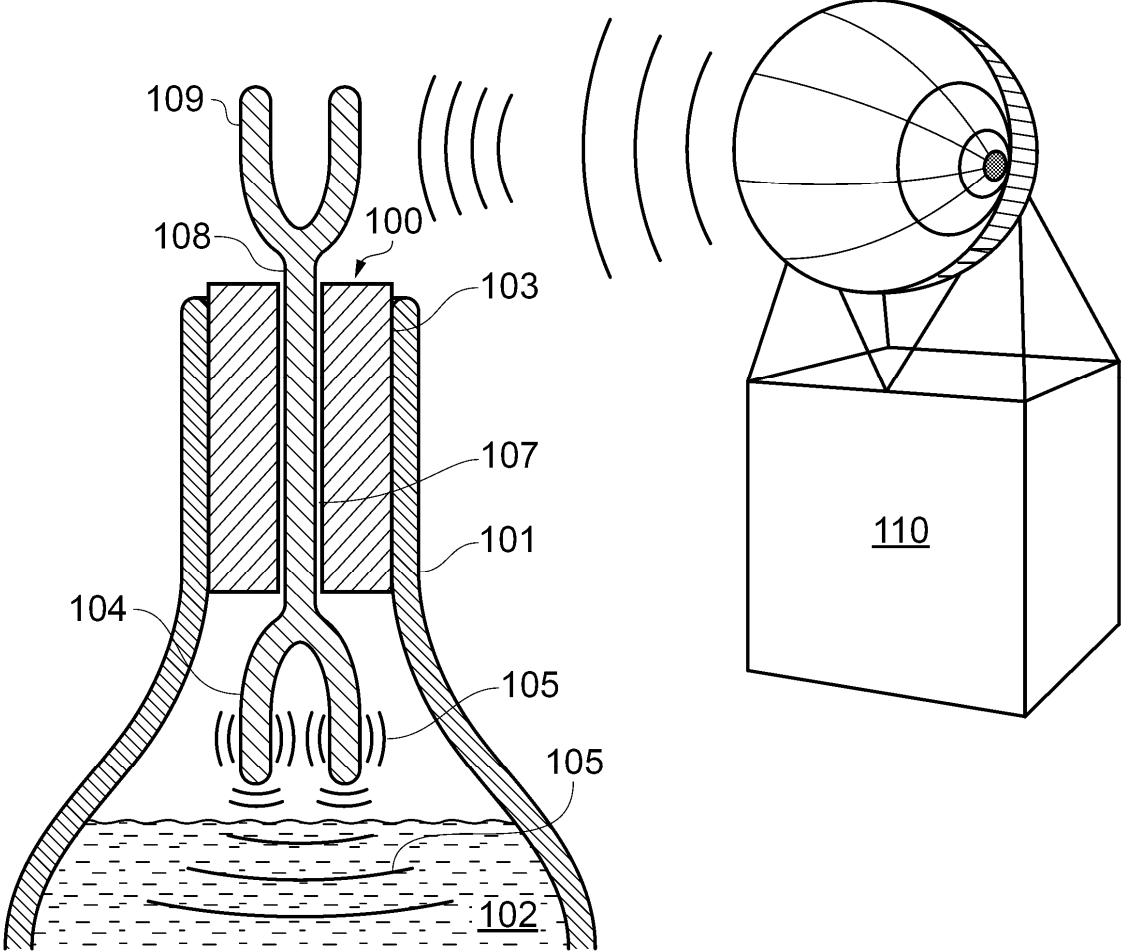
Document D1: Article from the magazine "Whisky"

5 [001] The figure shows a closure 100 and a bottle 101 containing whisky 102. The bottle 101 is closed by the closure 100. The closure 100 is arranged to accelerate the maturing process of the whisky 102 by means of sound waves. The closure comprises a body 103, a first tuning fork 104, a metal rod 108 and a second tuning fork 109. The metal rod is mounted in a hole 107 through the body 103. The hole 107 also serves as an inlet for oxygen, which is essential for the maturing process. The first tuning fork 104 generates sound waves 105 which propagate in the whisky. The sound waves 105
10 accelerate the maturing process of the whisky. The body 103 is made of cork.

[002] To generate the sound waves 105, the second tuning fork 109 is exposed to sound waves generated by a loudspeaker 110. The second tuning fork 109 then vibrates at its resonance frequency. The vibrations cause the first tuning fork 104 to likewise
15 vibrate at its resonance frequency, thereby generating the sound waves 105 of a specific frequency. The loudspeaker 110 comprises an electromechanical vibrator, for example an electromagnetic coil vibrator.

[003] The dimensions of the tuning forks 104 and 109 are chosen so that the sound
20 waves 105 generated by the first tuning fork 104 accelerate the production of a specific flavour in the whisky. Combinations of flavours can be developed by using different closures one after another, each closure having a differently dimensioned tuning fork. Frequencies of at least 1kHz have to be used, because at lower frequencies the maturing process is only minimally accelerated.





Document D2: Article from the magazine "All about wine"

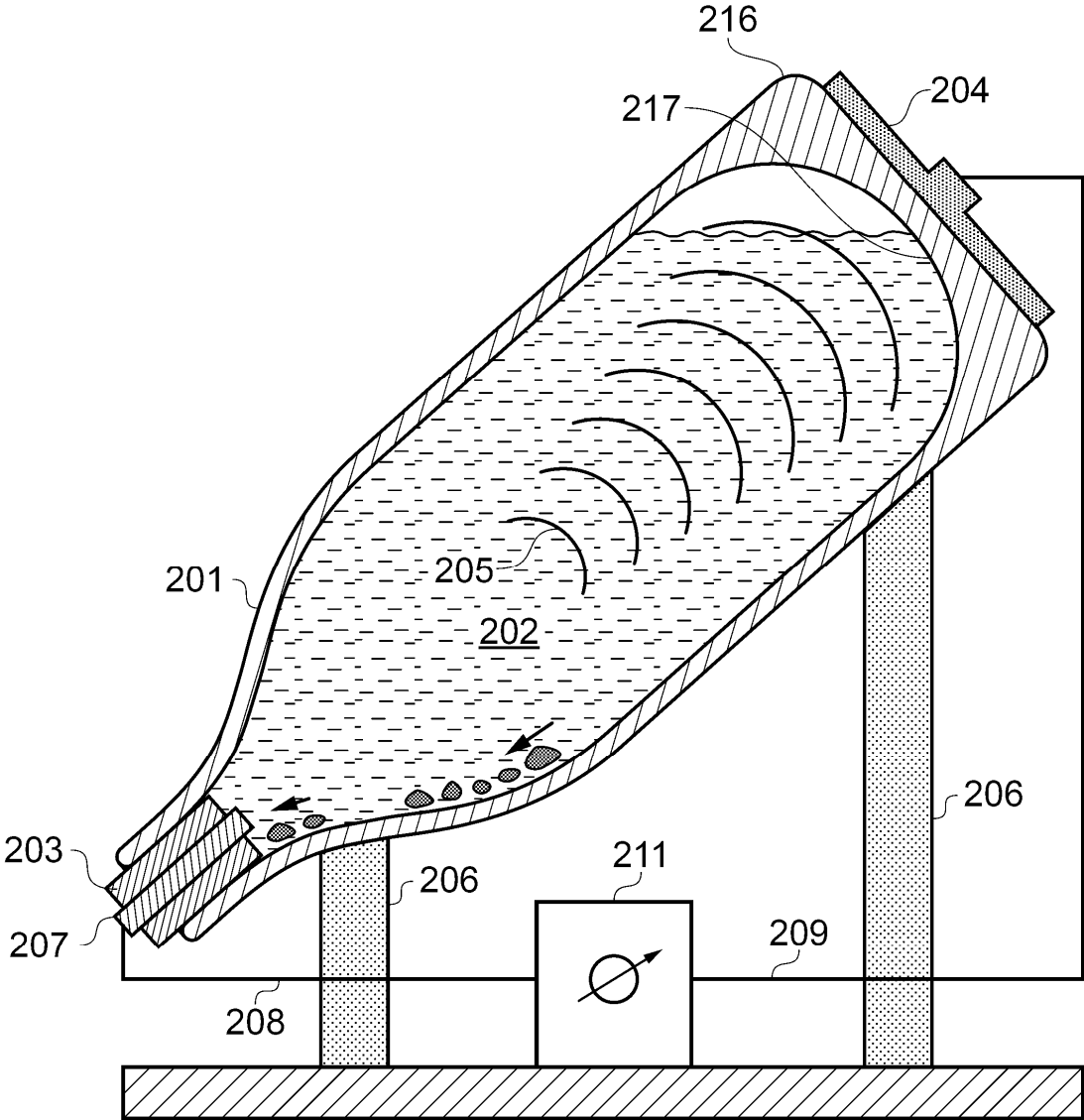
5 [001] Sediments of yeast in a bottle of sparkling wine must be removed during the maturing process. At regular intervals, the bottle is shaken by hand with the neck of the bottle pointing downwards. The shaking moves the sediments towards the bottle neck. The sediments can be frozen in the bottle neck and then removed.

10 [002] In some cellars a technique called *micro-shaking* is used. This technique uses mechanical vibration waves generated by a piezoelectric vibrator attached to the bottle. *Micro-shaking* generates less carbon dioxide gas in the bottle than shaking by hand and therefore reduces the risk of the bottle exploding.

15 [003] The figure shows how *micro-shaking* is implemented. A bottle 201 filled with sparkling wine 202 is held in a rack 206. The bottle 201 comprises a base 216 with an internal parabolic surface 217 for withstanding high pressure. A piezoelectric vibrator 204 for generating mechanical vibration waves 205 is attached to the outer surface of the bottle 201. The mechanical vibration waves 205 propagate through the sparkling wine 202 in the bottle 201. In order to generate as little carbon dioxide gas as possible, the frequency of the mechanical vibration waves is fixed at 0.1 kHz.

20 [004] The bottle 201 is closed with a closure 203. The closure 203 comprises a pressure sensor 207 for sensing the pressure in the bottle 201. A control unit 211 is electrically connected to the pressure sensor 207 via a cable 208 and to the piezoelectric vibrator 204 via a cable 209. The control unit 211 monitors the pressure sensed by the pressure sensor 207 and stops sending electrical signals to the piezoelectric vibrator 204 when the pressure reaches a threshold value. Because sparkling wine bottles are heavy, a piezoelectric vibrator having a width of several centimetres is used. The piezoelectric vibrator 204 is positioned far away from the pressure sensor 207 so that its influence on the pressure sensor 207 is minimal.





Client's letter

Dear Mr Cork,

[001] We sell closures for beverage containers and special bottles with closures. With respect to D1, our invention has the advantage that a single closure can generate sound waves at different frequencies. Therefore different specific flavours can be selectively developed in an alcoholic beverage using a single closure. The closures according to the third embodiment of our invention, having vibrator units comprising parabolic plates, are particularly efficient at directing sound waves in a beverage container.

[002] Below is a draft set of claims we propose for filing with your reply to the official communication. We are convinced that the subject matter of new claim 1 is new and inventive. Please make any amendments to the proposed claim set you consider to be necessary for the claims to fulfil the requirements of the EPC, whilst giving us the broadest possible scope of protection for our invention.

[003] Claim 1 has been restricted by including an electromechanical vibrator to establish novelty over D1. Furthermore, the air channel has been removed in order to also protect the closure shown in Fig. 1 of the patent application. The draft set of claims comprises a new claim related to a special bottle with an internal parabolic surface. We do not want you to add further dependent claims.

[004] We would like the European Patent Office to accelerate the examination of this application. If this is possible, please take all necessary steps in your letter of reply to ensure this happens.

Regards

C.H. Ardonnay



Draft set of claims

(The claims are marked up by underlining additional words and striking through deleted words with respect to the claims as filed)

1. Closure (10, 20, 30) for a beverage container (1, 21), the closure being arranged for accelerating the maturing process of a beverage (2), the closure comprising a body (3, 13, 23), a vibrator unit (4) for generating sound waves (5) in the beverage (2), ~~an air channel (17)~~, and means (8, 9) for conducting electrical signals to the vibrator unit (4), characterized in that the vibrator unit (4) comprises an electro-mechanical vibrator for generating the sound waves at different frequencies.
2. Closure according to claim 1, wherein the body (3, 13, 23) is made of wood, cork or a synthetic polymer.
3. Closure according to any previous claim, wherein the electro-mechanical vibrator unit (4) ~~is~~ comprises a piezoelectric vibrator (41) ~~for generating the sound waves at different frequencies.~~
4. Closure according to claim 3 comprising a vibrator plate (43) having a parabolic surface.
5. Closure according to any previous claim comprising an air channel (17).
6. In a bottle, a closure according to any previous claim, wherein the bottle (21) has an internal parabolic surface (16).

