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(54) Title
DEVICE FOR ACCELERATING THE AGING PROCESS OF WINE DEVICE FOR ACCELERATING THE AGING PROCESS OF WINE A container to accellerate vine aging made of a porous material and equipped with an agitator which comprises wooden staves.

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Abstract

Disclosed herein is a wine aging container made from porous material, comprising an internal stirring device comprising a perforated horizontal bar reversibly connected to woodens staves. Part of the lower portion of the inner surface of the wine aging container is impervious to oxygen and the method of operation involves blowing an inert gas into container via a cask funnel.

2019200924 09 Feb 2019

Editorial Note

2019200924

Please Note that there are 3 pages of Description and they are not numbered.

DESCRIPTION

Application for a PATENT FOR THE INVENTION entitled:

DEVICE FOR ACCELERATING THE AGING PROCESS OF WINE

On behalf of INK S.R.L., of Italian nationality, with registered office in
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Technical field

The present invention belongs to the field of containers used in the vinification industry, in particular to the sector of containers used for wine aging and for wine refining. More specifically, the invention belongs to the sector of containers used to age wine, enriching it through contact with wooden essences and ensuring at the same time an appropriate level of oxygenation. The invention pertains to a container which allows the accelerated aging of wines and alcoholic beverages through the combined use of toasted wood and oxygenation.

State of the art

After fermentation, which turns sugar into alcohol and carbon dioxide, most wines must be left to mature; during the maturation phase, wine is stored in special containers. There are different types of containers for the aging and refining processes of wine. Among these, are metal or polymeric materials containers; however, in order to obtain better quality results, wooden containers are generally used, such as barrels and vats, in which wine can be enriched through contact with wood essences and through the extraction of compounds from wood, typically durmast or oak.

In addition to the assimilation of specific aromas, aging is a method that guarantees a delicate oxidation, which can make wine mature, so that the different components blend together and the wine is more harmonious; in addition, through this controlled evolution, wine comes to handle preservation better and is therefore more resistant to a future oxidation. Thanks to contact with wood the wine undergoes a series of chemical and physical alterations that alter its structure in a significant way; for example, the contribution of the oak's tannins refine that already present in red wine, while giving white wines an appreciated tannic aftertaste, which they would not have otherwise. Another important advantage of wooden containers consists of the possibility of this material to allow a certain degree of oxygenation, the so-called micro-oxygenation, through the tracheas (vessels) of the wood; these are agglomerations of plant cells comparable to small tubes, without transverse partitions.

In the aging process of red wines, it is important that the oxidation of some substances contained in them occurs in a slow and well-regulated way, and this occurs through the calibrated passage of oxygen through the porosity of wood. The slow oxygen permeation facilitates the formation of flavanic polymers, which by creating more voluminous molecules, lose their astringency and soften the taste of the wine. Furthermore, the controlled oxidation of ethanol to an acetaldehyde promotes the aggregation of flavans with anthocyanins, facilitating the hyperchromic effect and creating co-pigments with a more intense colour and which are more stable in time.

During the aging process, chemical reactions slowly take place in the wine; these are essential for the stabilization of the colour, for the softening of the tannins and for the creation of the aroma. The use of wooden barrels facilitates these reactions. This process

can have a varying duration, which depends on the type of wine as well as the size of the barrel. In a small barrel, wine is more closely in contact with wood
and air and therefore matures much faster than in a large barrel.
Another important factor for wine aging is whether it occurs in a new or an old barrel; this is because an old barrel has little influence on the taste of wine, while a new barrel presents wood that is rich with tannins that give wine a specific aroma.
In order to increase the interaction of wine and wood it is advantageous to use small containers, even though this increases production costs; for this reason, barrels of small dimensions called 'barriques' are in use.

Known solutions have some disadvantages, especially related to the extensive time necessary to properly oxygenate wine and to enrich it with tannins and with other wood compounds. To increase the oxygenation of wine during aging, devices called oxygenators or aerators have also been developed. These diffuse air into wine, to increase contact between the latter and oxygen. Another limitation of current technologies is inherent to the necessity of using small barrels to increase the interaction area between wine and wood, with the consequent increase of costs.

Purposes and summary of the invention
The first object of the present invention is that of providing a wine aging container that allows the acceleration of the refinement process.
A second object of the invention is to provide a container that is easy to use and economical to make.
A specific object of the invention is to create a container which allows a significant degree of micro-oxygenation without having to resort to oxygenators.
In other words, the invention aims to create a container whose walls allow a limited passage of oxygen, to intensify the micro oxygenation of wine and, at the same time, is able to accelerate the exchange of substances between wine and wood, the latter in the form of toasted wooden staves.
The container, object of the present patent application, is easily reusable.
Other objects and advantages of the invention will be clear to those skilled in the art, from reading the following text.
The objects described above are achieved with a container made of a microporous material, such as for instance terracotta or clay, inside which lays a mechanical agitator, to which wooden staves are fixed, and which in turn are immersed in wine during the process of refining. The agitator is activated from the outside, typically with a small electric motor, or manually with any other known means; by operating the agitator the wooden staves move inside the wine, transferring the tannins and
the other compounds to the wine. In the upper part of the container, object of the present patent application, is a filler that is used to top up the wine inside, but which can also be used to diffuse an inert gas such as, for example, nitrogen.
In a particularly convenient and functional embodiment, the container referred to in the present application is partially vitrified inside, to reduce the overall micro-porosity
of the walls of the vessel; beneficially, vitrification is placed in the lower portion of the container, to facilitate cleaning and especially the removal of lees that settle at the bottom of the container. Adjusting the percentage of internal vitrified surface and the composition of the micro porous material of which the container is made, it is possible to regulate micro

oxygenation. The agitator is normally made by connecting a horizontal bar drilled to a vertical shaft, which protrudes from the top of the container through a rotating bushing.

Brief description of the drawings

Fig. 1 shows a top plan view of the container, object of the present patent application, where it is possible to see the cylindrical vessel (1), on which lays the filler (4); the upper end of the vertical shaft (21) through which the agitating device (2) is operated is also visible; in the embodiment shown, the axis (Z) of the vertical shaft (21) coincides with the vertical axis of the vessel (1).

The drawing also shows the trace of the cutting plane of the next drawing.

Fig. 2 shows a section, without any background, of the container shown along a vertical plane passing through the axis (Z) of the vertical shaft (21). Within the vessel (1) it is possible to see the lower end of the vertical shaft (21) to which the perforated horizontal bar (22) is connected and that supports the wooden staves (3). The vertical shaft (21) protrudes out of the vessel (1) through a rotating bushing (23).

It is also possible to see the part (11) of the internal surface of the vessel (1) which is impermeable to oxygen; as a matter of fact, the lower portion of the vessel (1) is coated with a layer that is impermeable to oxygen.

Detailed description of an embodiment of the invention

As per a preferred embodiment, the container object of the present patent application, includes a cylindrical vessel (1) made of a porous material, such as terracotta or clay, on top of which is placed a filling device (4), which is normally used to top up the wine, as well as to saturate the container with an inert gas, such as for example nitrogen.

It is important to note that all wine jars have caps and/or doors; sometimes, especially larger containers, also present manhole covers that are used
to clean the interior. Being a normal endowment of all wine jars, these will not be mentioned in the present application, if not to specify that the described devices
can also be connected to the container via said caps, doors or manhole covers.

Partially inside the vessel (1) there is an agitating device (2), which comprises a vertical shaft (21), coaxial with the vessel (1), whose upper end protrudes from the top of the vessel (1) through a rotating bushing (23) and is connected to activation means that start its slow rotation.

A perforated horizontal bar (22) is connected to the lower end of the vertical shaft (21); in turn, this is reversibly connected to some wooden staves (3). According to a particularly complete embodiment, the lower portion of the inner surface of the vessel (1) was made impermeable to oxygen through a vitrification treatment. Adjusting the amount of vitrified internal surface according to the micro porosity
of the material used, it is possible to adjust the oxygen permeability of the container.

CLAIMS

1. A wine aging container comprising a vessel (1), made from a porous material, at the top of which a cask funnel (4) is placed, **characterized in that** it receives internally thereto a stirring device (2) which wooden staves (3) are connected to, the latter being at least partially immersed in wine.

2. The container according to claim 1 **characterized in that** said stirring device (2) comprises a vertical shaft (21) the upper end of which comes out of the container by way of a rotary through hole (23) and is connected to driving means capable of driving it into rotation.

3. The container according to claim 1 or 2 **characterized in that** a horizontal bar (22) is integrally connected to the lower end of said vertical shaft (21), and said wooden staves (3) are reversibly connected to such horizontal bar.

4. The container according to claim 3 **characterized in that** said horizontal bar (22) is perforated.

5. The container according to any of the previous claims **characterized in that** a part (11) of the inner surface of said vessel (1) is impervious to oxygen.

6. The container according to claim 5 **characterized in that** said part (11) of said inner surface of said vessel (1)

that is impervious to oxygen coincides with the surface of the lower portion of said vessel (1). 25

7. The container according to claim 5 or 6 **characterized in that** said part (11) impervious to oxygen is at least partially vitrified.

8. The container according to any of the previous claims **characterized in that** said vessel (1) is an earthenware 30 one.

9. The container according to any of the previous claims **characterized in that** said vessel (1) has a cylindrical

shape.

10. A method for using a container according to claim 2 **characterized in that** it comprises the following steps:

a) pouring wine into said vessel (1);

b) blowing an inert gas into said vessel (1) via said cask 5 funnel (4);

c) starting said driving means used to drive the vertical shaft (21) of the stirring device (2);

d) taking wine out.

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The Patent Attorney

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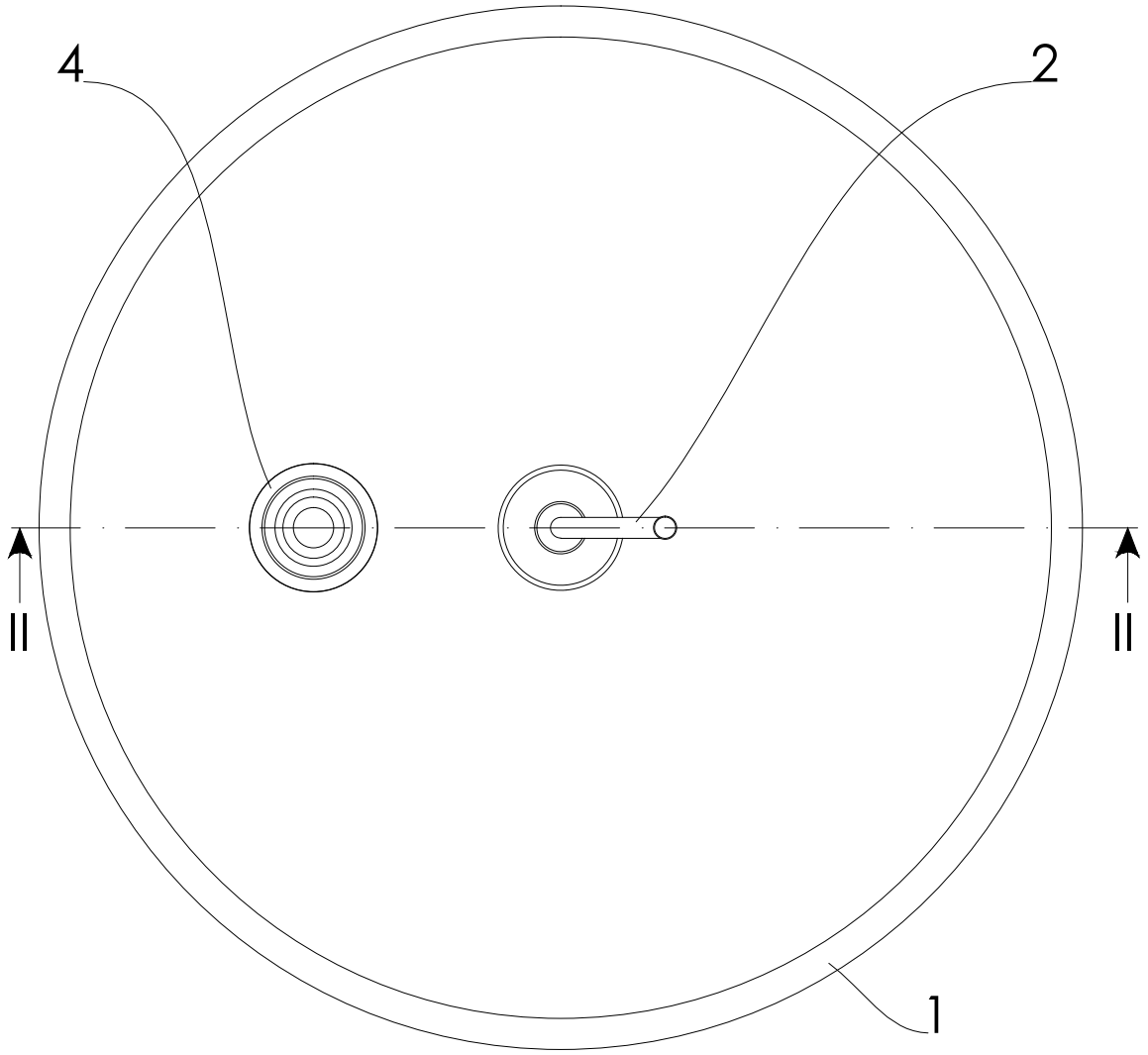

FIG. 1

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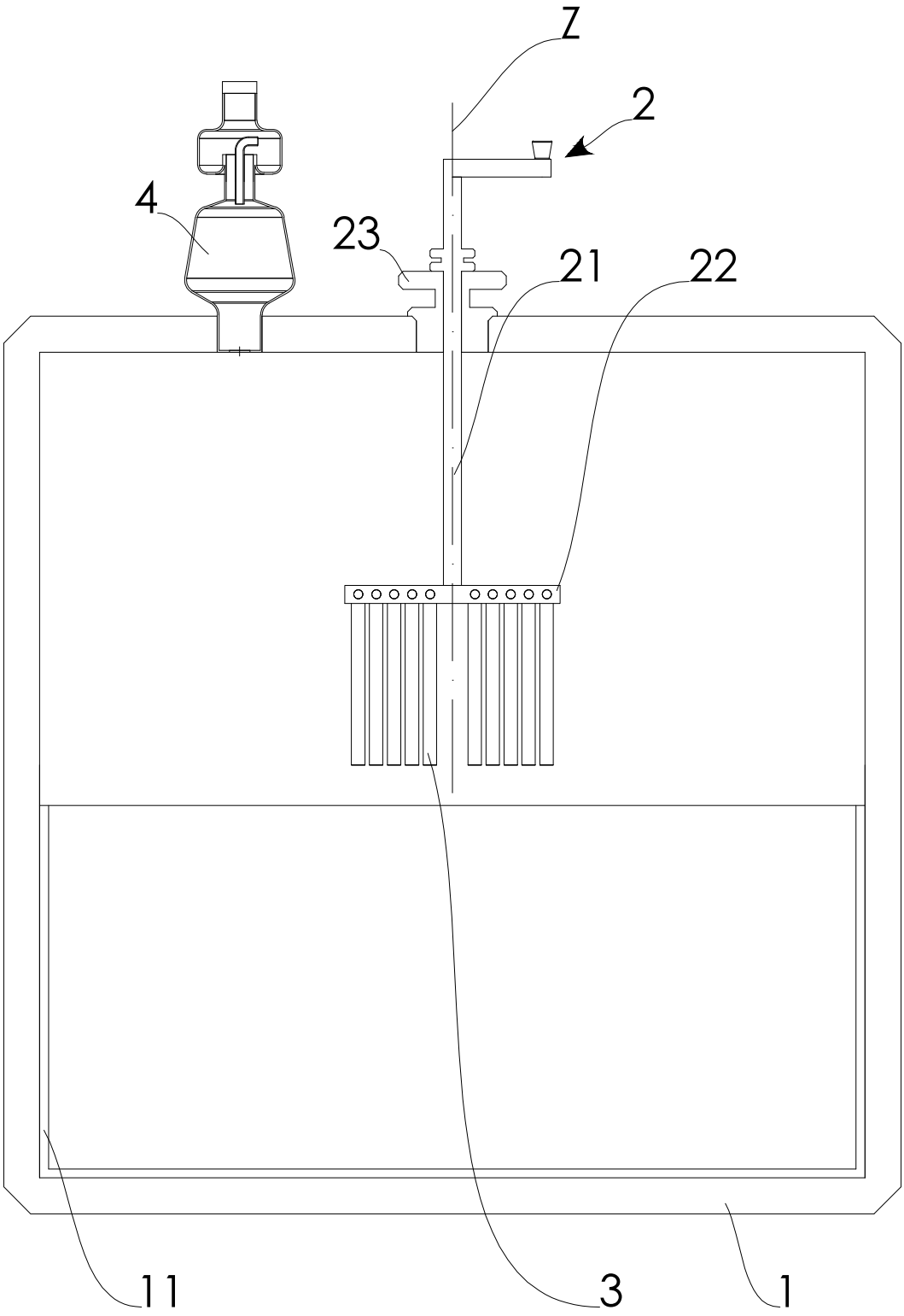

FIG. 2