(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 559 536 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
03.08.2005 Bulletin 2005/31

(51) Int Cl.[7]: **B30B 9/06**, B30B 9/22

(21) Application number: **04380021.8**

(22) Date of filing: **29.01.2004**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR
Designated Extension States:
AL LT LV MK

(71) Applicant: **Alonso Juarros, Silvino**
09006 Burgos (ES)

(72) Inventor: **Alonso Juarros, Silvino**
09006 Burgos (ES)

(74) Representative: **PROPI, S.L.**
Jorge Juan, 19
28001 Madrid (ES)

(54) Vertical grape press and pressing process carried out by means thereof

(57) A vertical grape press, of those having a general constitution basically made up of a vat (1) receiving the grape mass (4) to be pressed, a vertically displaceable plate-piston (2) closing the vat (1) on the upper end, and a must collection tray (3) closing this vat (1) on the lower end, the vertical press being characterised in that between the plate-piston (2) and the grape mass (4), there is a flexible resilient roof (5) covering the entire surface of this grape mass (4) and which has adjustable fluid drive means associated thereto capable of displacing it against said grape mass (4) to be pressed; and a pressing process carried out with a fluid-driven flexible resilient roof (5) which is actuated in one or several successive repetitions.

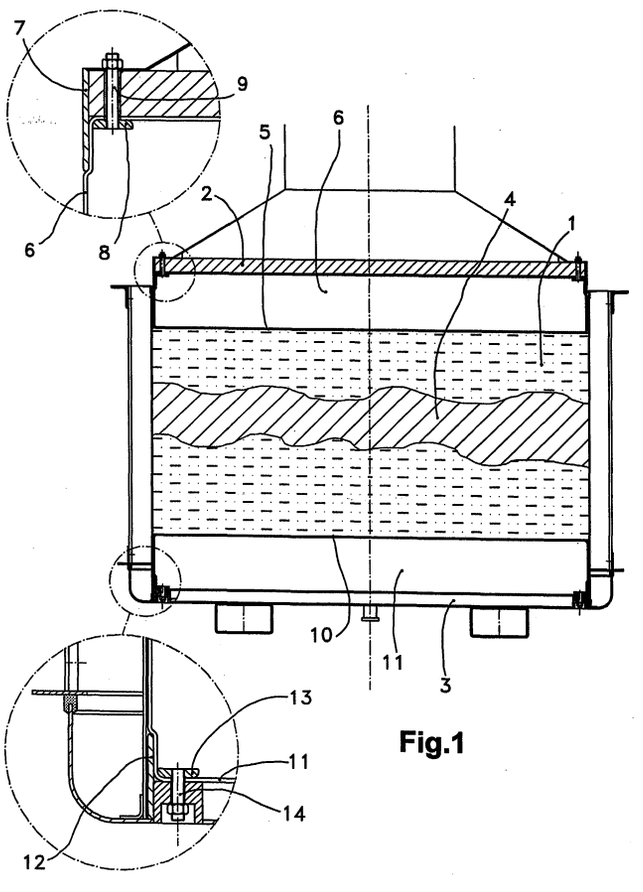

Fig.1

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Description

FIELD OF THE INVENTION

[0001] This invention concerns a particular constitution of a vertical press for the production of must, of the type basically made up of: a vat receiving the grape mass to be pressed; a vertically displaceable plate-piston which closes the vat recipient at the upper end; and a tray for collecting the must produced, which closes said vat at the lower end.

[0002] Furthermore, this invention concerns a peculiar pressing process which is favoured by the particular constitution of the vertical grape press proposed herein.

PRIOR STATE OF THE ART

[0003] Once the grapes have been selected and harvested in a ripe state, the quality of the wine obtained firstly and greatly depends on the pressing thereof. Pressing is a process which must be carried out immediately after the grape harvest, in the least time possible and with the highest delicate care.

[0004] In the context of viniculture, the object of pressing is not a quick and brutal crushing of the grape mass, but it must achieve extracting or separating the liquid part from the solid part with the minimum amount of dilacerations, i.e. tears and crushings; such that the largest amount of juice is obtained as quickly as possible so that, in addition to a good process yield, the must is in contact with the solid parts (skin, pulp, stem, seeds, solid residues and other organic materials that come with the grape) the least amount of time possible. A clear must (without cloudiness) is thus obtained without the tannic substances substantially affecting the taste thereof. The speed of the process and the quality of the must obtained are inversely proportional, for which reason the best results will be obtained by correctly combining both of these, choosing for this the most suitable means and processes.

[0005] Two types of press are used in the industrial production of must: the vertical press with a horizontal plate-piston, which is more traditional; and the horizontal press for pressing by means of a material screw feeder.

[0006] The horizontal press mentioned second has a large yield, but it carries out a not very delicate pressing, where the grapes are fed and subjected to considerable frictions and dilacerations. The result is a cloudy must which, before moving on to the fermentation stage, must be subjected to clarification operations with the addition of separating substances and settling. A variant of this type of horizontal press is the so-called "membrane" press, where the must extraction is somewhat more progressive and a greater self-filtering and less oxidation are achieved; however, this still does not obtain the best possible quality of the must.

[0007] When it comes to producing greatly elaborated high-quality wines or "*cavas*" (sparkling wines), the use of vertical presses subjecting the grape mass to lower pressure is resorted to, resulting in an increase in the quality of the must.

EXPLANATION OF THE INVENTION AND ADVANTAGES

[0008] In view of this state of the art, this invention proposes a vertical press designed to obtain the highest quality of must, having the particularity that, between the plate-piston and the grape mass to be pressed, there is a roof of a flexible and resilient nature covering the entire surface of this grape mass and which has adjustable fluid drive means associated thereto capable of displacing it against said grape mass to be pressed. A variant of this embodiment is that in which said flexible resilient roof belongs to a first air or water-filled cushion which is made of alimentary canvas and coupled to a pump for the filling or emptying thereof. It is preferably filled with air, but it can also be inflated with water.

[0009] This vertical press constitution firstly makes possible a high degree of adaptation of the flexible resilient roof to the irregular topography of the upper surface of the grape mass deposited in the vat. In this way, the possibility of there being air bubbles between the pressing member and the grape mass is substantially reduced.

[0010] Secondly, and as a consequence of the foregoing, the pressing operation takes place with a uniform distribution of pressure, i.e. without generating excess pressures due to the existence of air bubbles, which are the cause of counterproductive effects in the colour, odour and taste of the must.

[0011] Another very important feature of this proposed vertical press is that the pressing of the grape mass is the task of the flexible resilient cushion, by means of the inflation thereof with a suitable pressure which is notably lower than that of a conventional vertical press. Thus, the plate-piston now has the mere task of positioning the cushion in the suitable location for beginning the pressing operation. An important consequence of this is that the construction need not be as sturdy as that of an equivalent conventional vertical press, nor do the hydraulic drive means need to be as powerful as the conventional ones, where the act of pressing was the task of the plate-piston; it is now sufficient to have a pneumatic or hydraulic pump for inflating the cushion and simpler and more economical hydraulic means for the positioning operation of the plate-piston and in order for this to act as a resistant element for much lower working pressures than the conventional ones.

[0012] Another particularity of the proposed constitution is that it allows releasing the air or liquid bubbles which may be generated by reducing the pressures existing on the grape mass to be pressed, by means of the controlled deflation of the cushion.

[0013] According to this proposed vertical press constitution, the pressing process carried out by means thereof comprises: a first approach operation in which said flexible resilient roof enters into contact with the upper part of the grape mass at a suitably lower pressure than that of the working pressure; a second operation in which said flexible resilient roof is driven by the fluid against the grape mass in suitable conditions of pressure and duration; a third operation of reduction of the drive, which can be the end of the pressing process or can be followed by one or several successive repetitions of said first and second operations; all this is carried out by means of cycles controlled by a programmable automation.

[0014] The invention contemplates the possibility of further incorporating a flexible resilient floor arranged between the grape mass and the must collection tray of the vat, which has adjustable fluid drive means associated thereto capable of displacing it against said grape mass. As in the case of the flexible resilient roof, said flexible resilient floor belongs to a second fluid cushion which is made of alimentary canvas and coupled to a pump for the inflation/deflation thereof.

[0015] In correspondence with the existence of the first and second, or upper and lower, cushions, the pressing process comprises: a first approach operation in which said flexible resilient roof is at a lower pressure than that of the working pressure, and enters into contact with the upper part of the grape mass which, in turn, rests on a said flexible resilient floor driven by fluid with a suitable pressure; a second operation in which said flexible resilient roof is driven by fluid against the grape mass in suitable conditions of pressure and duration, and in combination with an active or passive drive of said flexible resilient floor; a third operation of reduction of the drive of, at least, said flexible resilient roof, which operation can be the last of the pressing process or can be followed by one or several successive repetitions of said first and second operations; all this is carried out by means of cycles controlled by a programmable automation.

DESCRIPTION OF THE DRAWINGS AND REFERENCES

[0016] To better understand the nature of the present invention, the attached drawings show a preferred industrial embodiment, which has a merely illustrative and non-limiting character.

[0017] Figure 1 shows a vertical grape press according to the invention, which is sectioned along its vertical median plane, and which incorporates a first inflatable cushion (6), a second fluid-inflatable cushion (11), as well as enlarged-details both with reference to the anchoring thereof to the plate-piston (2) and to the must collection tray (3), respectively.

[0018] The following references are indicated in this figure:

1.- Vat
2.- Plate-piston
3.- Must collection tray
4.- Grape mass
5.- Flexible resilient roof
6.- First inflatable cushion
7.- First outer ring
8.- First inner ring
9.- First bolt
10.- Flexible resilient floor
11.- Second inflatable cushion
12.- Second outer ring
13.- Second inner ring
14.- Second bolt

PREFERRED EMBODIMENT OF THE INVENTION

[0019] With reference to the drawings and references listed above, a preferred embodiment of the invention is illustrated in the attached drawing, referring to a vertical grape press of those having a general constitution basically made up of a vat (1) receiving the grape mass (4) to be pressed, a vertically displaceable plate-piston (2) closing the vat (1) at the upper end, and a must collection tray (3) closing this vat (1) at the lower end. Wherein, according to an essential feature of the invention, there happens to be a roof (5) of a flexible and resilient nature between the plate-piston (2) and the grape mass (4), which covers the entire surface of this grape mass (4) and has adjustable fluid drive means associated thereto capable of displacing it against said grape mass (4) to be pressed. A preferred embodiment variant of the invention consists in that said flexible resilient roof (5) belongs to a first cushion (6) made of alimentary canvas and coupled to a pump for the inflation/deflation thereof; other possible contemplated variants are that in which the coupling of the first cushion (6) to its pump is carried out through the plate-piston (2), or that in which the upper closing wall of the first cushion (6) is constituted of the plate-piston (2) itself.

[0020] The pressing process with this proposed vertical press consists of: a first approach operation in which said flexible resilient roof (5) enters into contact with the upper part of the grape mass (4) at a suitably lower pressure than that of the working pressure; a second operation in which said flexible resilient roof (5) is driven against the grape mass (4) in suitable conditions of pressure and duration; a third operation of reduction of the drive which can be the end of the pressing process or can be followed by one or several successive repetitions of said first and second operations; all this is carried out by means of cycles controlled by a programmable automation.

[0021] Another variant of the invention is that shown in Figure 1; where, as well as the flexible resilient roof (5), there is a flexible resilient floor (10) arranged between the grape mass (4) and the must collection tray (3) of the vat (1), which floor has adjustable drive means

associated thereto capable of displacing it against said grape mass (4). According to an embodiment variant with regard thereto, said flexible resilient floor (10) belongs to a second cushion (11) which is made of alimentary canvas and coupled to a pump for the inflation/deflation thereof; other possible variants are that in which the coupling of the second cushion (11) to its pump is carried out through said must collection tray (3); or that in which the lower closing wall of the second cushion (11) is provided by the must collection tray (3) itself.

[0022] In the event of there being first (6) and second (11) cushions, the pressing process is like the previous one, but with the possibility of combining and complementing actions due to this second cushion (11), making the treatment of the grape mass (4) more delicate in its lower part as well. This pressing process consists of a first approach operation in which said flexible resilient roof (5) is at a lower pressure than that of the working pressure and enters into contact with the upper part of the grape mass (4) which, in turn, rests on a said flexible resilient floor (10) driven with a suitable pressure; a second operation in which said flexible resilient roof (5) is driven against the grape mass (4) in suitable conditions of pressure and duration, and in combination with an active or passive drive of said flexible resilient floor (10); a third operation of reduction of the drive of, at least, said flexible resilient roof (5), which operation can be the last one of the pressing process or can be followed by one or several successive repetitions of said first and second operations; all this is carried out by means of cycles controlled by a programmable automation.

[0023] For fixing itself to the plate-piston (2), said first cushion (6) incorporates anchoring means constituted of an outer ring (7), an inner ring (8) and a plurality of first bolts (9), said first outer ring (7) is bound in turn to the contours of the first cushion (6) and of the plate-piston (2), said inner ring (8) borders the upper wall of the first cushion (6), and said first bolts (9) extend from the first inner ring (8) going through the plate-piston (2) to receive as many anchor nuts on its end.

[0024] For its part, said second cushion (11) incorporates anchoring means for anchoring it to the must collection tray (3) which are constituted of a second outer ring (12), a second inner ring (13) and a plurality of second bolts (14), said second outer ring (12) is bound in turn to the contours of the second cushion (11) and of the must collection tray (3), said second inner ring (13) borders the lower wall of the second cushion (11), and said second bolts (14) extend from the second inner ring (13) going through the must collection tray (3) to then receive as many anchor nuts on its end.

[0025] Another particularity of the invention is that it can be easily adaptable to conventional vertical presses already built and operating.

Claims

1. A vertical grape press, of those having a general constitution basically made up of a vat (1) receiving the grape mass (4) to be presses, a vertically displaceable plate-piston (2) closing the vat (1) on the upper end, and a must collection tray (3) closing this vat (1) on the lower end, the vertical press according to the invention being **characterised in that** between the plate-piston (2) and the grape mass (4) there is a roof (5) of flexible and resilient nature covering the entire surface of this grape mass (4) and which has adjustable drive means associated thereto adjusted by the filling of water or air, which are capable of moving it against said grape mass (4) to be pressed.

2. A vertical grape press according to claim 1, **characterised in that** said flexible resilient roof (5) belongs to a first cushion (6) which is made of alimentary canvas and coupled to a pump for the inflation/deflation thereof.

3. A vertical grape press according to claim 2, **characterised in that** the coupling of the first cushion (6) to its pump is carried out through the plate-piston (2).

4. A vertical grape press according to claims 2 and 3, **characterised in that** the upper closing wall of the first cushion (6) is constituted of the plate-piston (2) itself.

5. A vertical grape press according to claim 2, **characterised in that** said first cushion (6) incorporates anchoring means for anchoring it to the plate-piston (2), which are constituted of an outer ring (7), an inner ring (8) and a plurality of first bolts (9), said first outer ring (7) is bound in turn to the contours of the first cushion (6) and the plate-piston (2), said inner ring (8) borders the upper wall of the first cushion (6), and said first bolts (9) extend from the first inner ring (8), going through the plate-piston (2) to receive as many anchor nuts on its end.

6. A vertical grape press according to claim 1, **characterised in that**, as well as said flexible resilient roof (5), there is a flexible resilient floor (10) arranged between the grape mass (4) and the must collection tray (3) of the vat (1), which floor has adjustable pneumatic o hydraulic drive means associated thereto capable of displacing it against said grape mass (4).

7. A vertical grape press according to claim 6, **characterised in that** said flexible resilient floor (10) belongs to a second pneumatic or hydraulic cushion (11) which is made of alimentary canvas and cou-

pled to a fluid pump for the inflation/deflation thereof.

8. A vertical grape press according to claim 7, **characterised in that** the coupling of the second fluid cushion (11) to its pump is carried out through said must collection tray (3).

9. A vertical grape press according to claims 7 and 8, **characterised in that** the lower closing wall of the second cushion (11) is provided by the must collection tray (3) itself.

10. A vertical grape press according to claim 7, **characterised in that** said second cushion (11) incorporates anchoring means for anchoring it to the must collection tray (3) which are constituted of a second outer ring (12), a second inner ring (13) and a plurality of second bolts (14), said second outer ring (12) is bound in turn to the contours of the second fluid cushion (11) and the must collection tray (3), said second inner ring (13) borders the lower wall of the second fluid cushion (11), and said second bolts (14) extend from the second inner ring (13), going through the must collection tray (3) to receive as many anchor nuts on its end.

11. A pressing process carried out with the vertical press according to claims 1 to 5, **characterised in that** it comprises: a first approach operation in which said flexible resilient roof (5) enters into contact with the upper part of the grape mass (4) at a suitably lower pressure than that of the working pressure; a second operation in which said flexible resilient roof (5) is driven by fluid against the grape mass (4) in suitable conditions of pressure and duration; a third operation of reduction of the drive which can be the end of the pressing process or can be followed by one or several successive repetitions of said first and second operations; all this is carried out by means of cycles controlled by a programmable automation.

12. A pressing process carried out with the vertical press according to claims 1 to 10, **characterised in that** it comprises: a first approach operation in which said flexible resilient roof (5) is at a lower pressure than that of the working pressure and enters into contact with the upper part of the grape mass (4) which, in turn, rests on a said flexible resilient floor (10) driven by fluid with a suitable pressure; a second operation in which said flexible resilient roof (5) is driven by fluid against the grape mass (4) in suitable conditions of pressure and duration, and in combination with an active or passive fluid drive of said flexible resilient floor (10); a third operation of reduction of the drive of, at least, said flexible resilient roof (5), which operation can be the last one of the pressing process or can be followed by one or several successive repetitions of said first and second operations; all this is carried out by means of cycles controlled by a programmable automation.

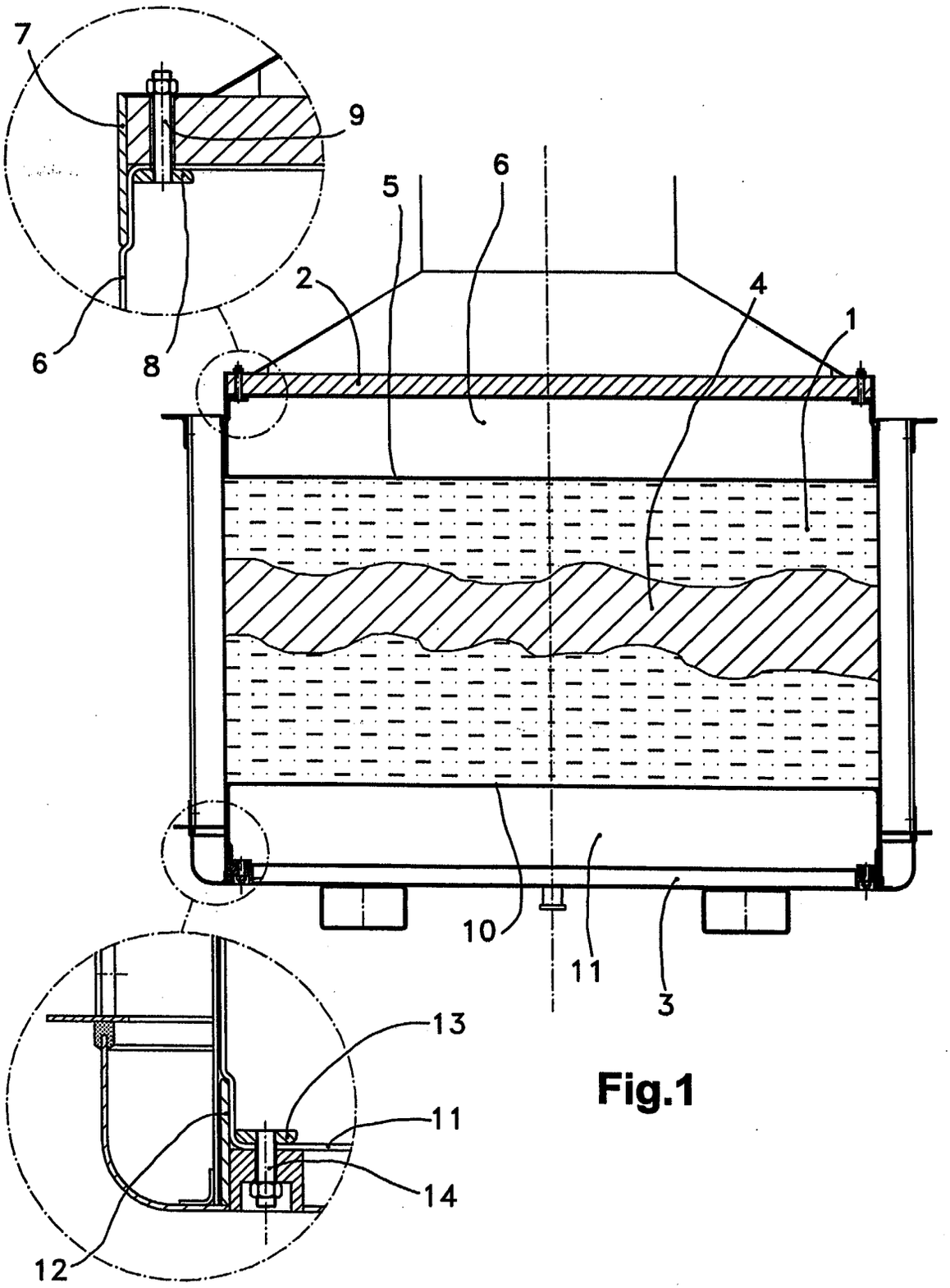

Fig.1

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 38 0021

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	25 June 2004	Baradat, J-L

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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