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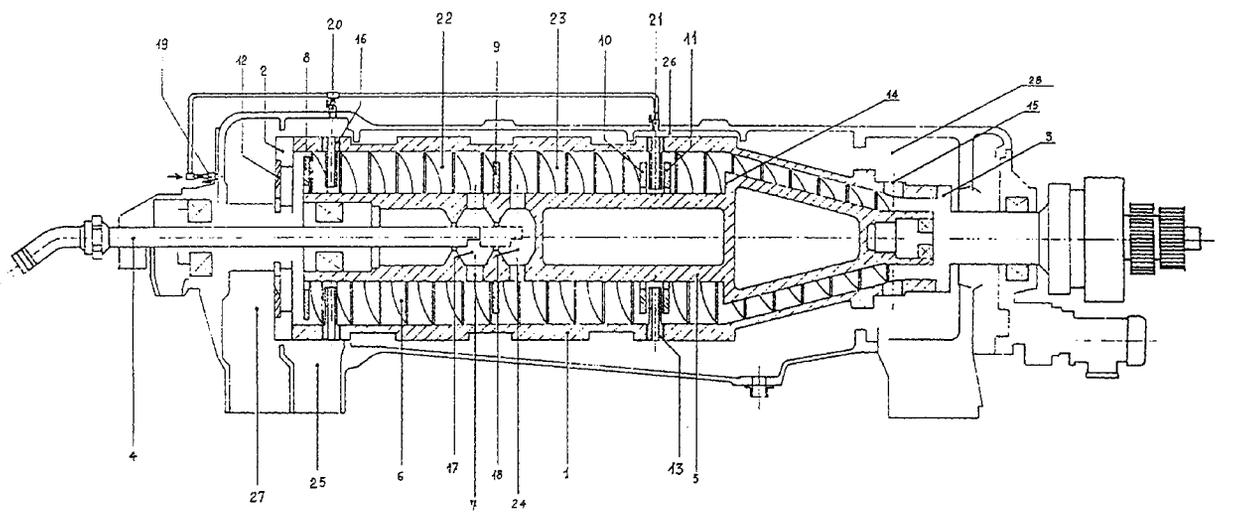
(54) Horizontal centrifuge for the oil extraction from oily mixing

(57) The horizontal centrifuge for the oil extraction from oily mixings by double extraction, comprises a drum (1), in the inner part of which is mounted a scroll (5), with the relative central axe, drum and scroll which rotate at different regimes and an axial diaphragm (4) is delimiting two extraction chambers (22,23) in the interstice between scroll and drum, the oily mixing is being aducted in the central axe's internal by means of a tube (4), in the internal of the scroll's central axe which have two chambers (17,18), each one is communicating with one of the respective separation chambers by means of respective series of radial nozzles (7,24), this tube is adjustable to leak out in one of those chambers.



EP 0 845 296 A1

Description

Sector of invention

The present invention refers to the sector of centrifuges for oil extraction from an oily mixing which comes from the treatment of olives. Those centrifuges, being used in the oil industry, are known to skilled technicians also as "decanter". In particular, the present invention refers to a horizontal centrifuge for oil extraction from an oily mixing due to previous rivendication No. 1.

Basis of the Invention

In the oil industry, oil will be obtained from an oily mixing which comes from an olive treatment and also from other oily products. Oil will be obtained by means of extraction through centrifugation, which is based on the separation of liquids (essentially water and oil), which are contained in the oily mixing and which differ from each other for their specific weights in a centrifugal area.

As known, centrifuges for oil extraction have a cilindrical drum with conical or cilindrical extremities; inlet heading with nozzles for the outlet of liquids (water and oil), a closing heading at the conical extremity with perforations for the sansa outlet; a coaxial scroll disposed in the internal part of the drum, which is foreseen to transport the humid solids to the outlet perforations which are disposed on the conical or cilindrical extremity, and a leading-in tube for the oily mixing from which oil will be extracted.

The centrifuges are able to work in a bimodal way, this is to say in two or three phases functioning. You will have a two phases functioning, when there are foreseen an oil outlet and an outlet for solid residual, this is to say for sansa and water. You will have a three phases functioning, when three outlets are foreseen respectively for each phase, this is to say for oil, water and sansa.

On this premise, it is evident that the main aim of horizontal centrifuge's technology is to obtain possibly the highest extraction efficiency.

The only limit to this efficiency is determined by the solid residual or sansa in which there still will be a considerable percentage of oil content.

In the past, two extraction series were foreseen by means of two different centrifuges. Afterwards it has been suggested the solution to realize the second extraction in the same centrifugal equipment, considering an additional radial extraction along the path length of extraction, besides a delimiting diaphragm. The radial extraction occurs by means of an additional series of radial nozzles. Such a solution is represented by the previous technology and very close to the invention's subject of this applcation.

In centrifuge's functioning at two phases are foreseen two oil outlets.

The inconvenience of those centrifuges at double extraction is that around the nozzles of radial extraction, there will be an accumulation of sansa quantities. This happens in particular with slurried olives, which do not peel very well. The result is a blocking up of the nozzles and therefore the machine has to be stopped and cleaned.

The general task of the present invention is to supply a horizontal centrifuge for the oil extraction, which offers a considerable better efficiency instead of the centrifuges already known.

The particular task of the present invention is furthermore to supply a centrifuge which doesn't suffer the inconvenience already mentioned above.

This task will be accomplished due to the teaching of the present invention with a centrifuge according to the enclosed claim 1.

This invention will be intended in the best way due to the following particular description of its favoured realization form, which is merely an example, but not limitative, in relation to the design enclosed, in which

- FIGURE 1 shows a centrifuge due to the present invention in a longitudinal cross-section.

In relation to FIGURE 1, the horizontal centrifuge for the oil extraction from oily mixings consists of drum 1 supplied with two headings (2,3) and with a registrable leading-in tube (4) for the immission of the mixing, the tube (4) passes through the first heading (2) and ends in the internal part of the scroll (5), on the central axe of the same, the which forms a unique body with the helicoidal spirals, giving to the scroll the ability to expel the solids fed. The central axe of the scroll (5) are provided with four perforations (7) and further four perforations (24), corresponding to two respective chambers (17,18) for the mixing's outlet which will be fed through an adjustable tube (4).

On the central axe of the scroll (5) are applied four diaphragms (8,9,10,11). The diaphragm (8) with internal perforations is located near the closing heading (2) and allows the oil passing towards the outlet (12), in this way the machine works at two phases and allows the dam of oil, when the machine works at three phases. The diaphragm (9) divides the two extraction chambers. The diaphragms (10 and 11) are provided with perforations in the internal part which allow the four tubes (13) not to emulsify the liquid (oil) in the second chamber and not to suck the solid accumulated in that point to interrupt the spiral, the spiral's interruption allows the passing of the four tubes (13). The perforations in the internal part of the two diaphragms (10 and 11) allow the oil passing, in order to be sucked from the tubes (13) which on their turn bring oil to the drum's outside (1).

The extremity (14) of the central axe of the scroll (5) doesn't allow the oil passing towards the solid expulsion (15).

The four tubes (16) allow to remove oil from the separation chambers (22), both when machine works at two

phases, this is to say without addition of dilution water, and when machine works at three phases with addition of water.

In the internal part of the scroll's central axe (5) two chambers have been obtained (17,18) to allow the adjustable feeding pipe of the mixing (4) to discharge the mixing in a well definite position due to whether the machine works at two phases (chamber 17) and at three phases (chamber 18).

In the liquid collectors, for water and oil (25, 26 and 27), are applied three cocks (19, 20 and 21), which allow the washing by pressure of the little tubes and of the perforations (12) till the liquids can leave the same without interferences while the machine is extracting, in case the little tubes (13-16) and the perforations are blocked up, the machine has to be stopped and the horizontal centrifuge has to be cleaned manually.

After having described the construction of a centrifuge due to the present invention, it will now be described the functioning.

As already shown, there are foreseen for the present invention two ways of functioning: the way of two phases and three phases functioning.

The two phases functioning will be without the addition of dilution water. In this case the olive mixing will reach chamber (17) along the central axe of the scroll (5) by feeding tube (4) and will be projected through the perforations (7) in the separation chamber (22), in which there will be the division of liquids and solids. The heavier solids deposit itself on drum's wall (1) and they proceed through the expulsion scroll to drum's taper surpassing the diaphragm (9) to be expelled to the exit (15) and discharged in the collector (28). The water, containing the mixing, always follows the solid's proceeding, in order to be expelled at the outlet (15).

Solid and liquid go through the separation chambers 23 to be expelled at the outlet (15); along this path length, there will be set free the last percentage of oil which is contained after the separation in chamber (22) leaking through the tubes (13), as for oil is no more able to continue water and solid's path length, because, this will be obstructed by the extremity on the scroll's central axe (14), while oil passes through the perforations of diaphragm (8) in the separation chamber (22) and leaks out from the level dam of heading (12) and from those tubes (16) placed before diaphragm (8).

In the three phases way, with or without addition of water, there are foreseen the water outlet (12) and the oil outlets (13 and 16), leaving one part of the conical drum without liquids, while the oily mixing reaches chamber 18 of the scroll's central axe (5) through an adjustable feeding tube (4) and is projected to the separation chamber (23) through the perforations (24).

The solids being heavier will be deposited on the wall of drum's internal diameter (1) and by means of the expulsion scroll, solids will be put on forward to drum's taper to leak out (15) and to be discharged in the collector (28).

The oil contained in the mixing leaks out from tube (13), while water goes back and goes beyond the diaphragm (9) and entering the separation chamber (22) to leak out from the heading level (12), going through the space between the external disk's diameter of the diaphragm 8 and the internal diameter of the drum 1.

Going along this path length in the chamber 22, water gets rid of the percentage of oil it still contains, oil is leaking out from tube 16.

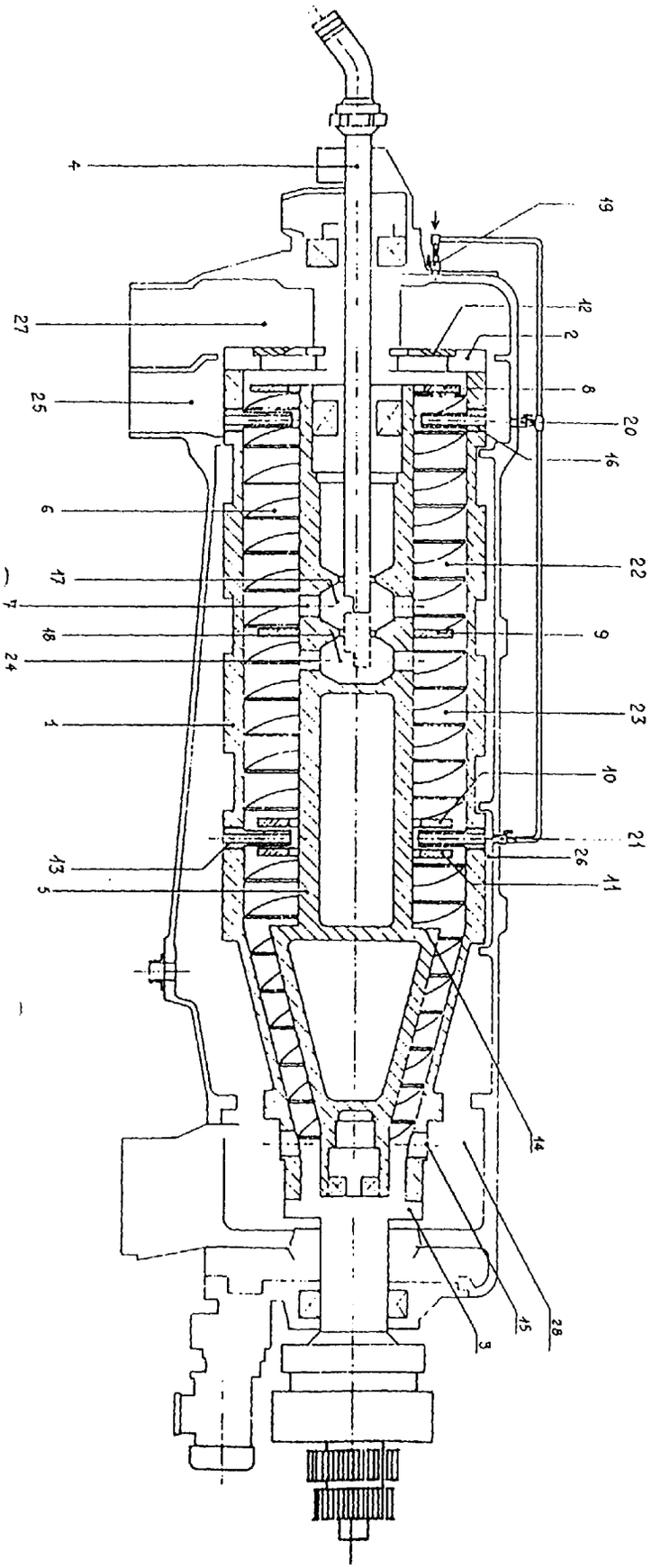
The present invention has been described and illustrated in relation to its specific realization, but it has to be explicitly understood that additions, variations and/or omissions can be done without leaving the protection area in relation, which will be limited only by the enclosed claims.

Claims

1. An horizontal centrifuge for oil extraction from oily mixing, comprises a carcass, in which is mounted a rotating drum and a rotating scroll, with the relative central axe, mounted in the drum, the drum and the scroll rotating at different regimes and comprise an axial diaphragm (9) delimiting two extraction chambers in the interstice between scroll and drum, and two series of radial nozzles for the oil extraction respectively in the before mentioned first and second extraction chamber; as well as comprising an adduction tube of this oily mixing in the internal part of the scroll's central axe already mentioned, the which is provided with openings for the leaking out of the same mixing into the mentioned interstice to submit it to the centrifugal area generated by the rotation of the drum and scroll, and comprising an outlet for the residual solid of the oily mixing; the interstice is closed by inlet and outlet headings, characterised by the fact, that these openings of the scroll's central axe are distributed in two series which put in comunication the two extraction chambers with its respective chambers (17; 18) supplied in series on the central axe; the mentioned adduction tube, being adjustable, is able to dispose itself in order to leaking out in one of the two chambers, and is able to leak out the mixing in the centrifugal area in one of the two separation chambers; the mentioned inlet heading shows the perforations (12) of the liquid's leaking out, the radial extraction nozzles are adjustable in order that those perforations of the inlet heading becomes also the oil's outlet in the two phases functioning and becomes also the water's outlet in the three phases functioning.

2. The centrifuge, due to claim 1, in which the mentioned radial nozzles in the second extraction chamber are protected on one and another side of the axial direction of the scroll by the respective diaphragms against the accumulation of residual sol-

ids thereon.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EUROPEAN SEARCH REPORT

Application Number
EP 97 20 3243

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	EP 0 704 248 A (NUOVA M.A.I.P.) * column 4, line 16 - column 6, line 41 * * figures 2,5-7 *	1,2	B04B1/20
Y	PATENT ABSTRACTS OF JAPAN vol. 10, no. 252 (C-369), 29 August 1986 & JP 61 082855 A (ISHIKAWAJIMA HARIMA HEAVY), 26 April 1986, * abstract *	1,2	
A	EP 0 574 364 A (RAPANELLI) * column 2, line 29 - column 4, line 18 * * figures 1,3 *	1	
A	GB 998 669 A (STARCOSA)		
A	DE 32 02 294 C (WESTFALIA SEPARATOR)		

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	22 January 1998	Leitner, J

CATEGORY OF CITED DOCUMENTS

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