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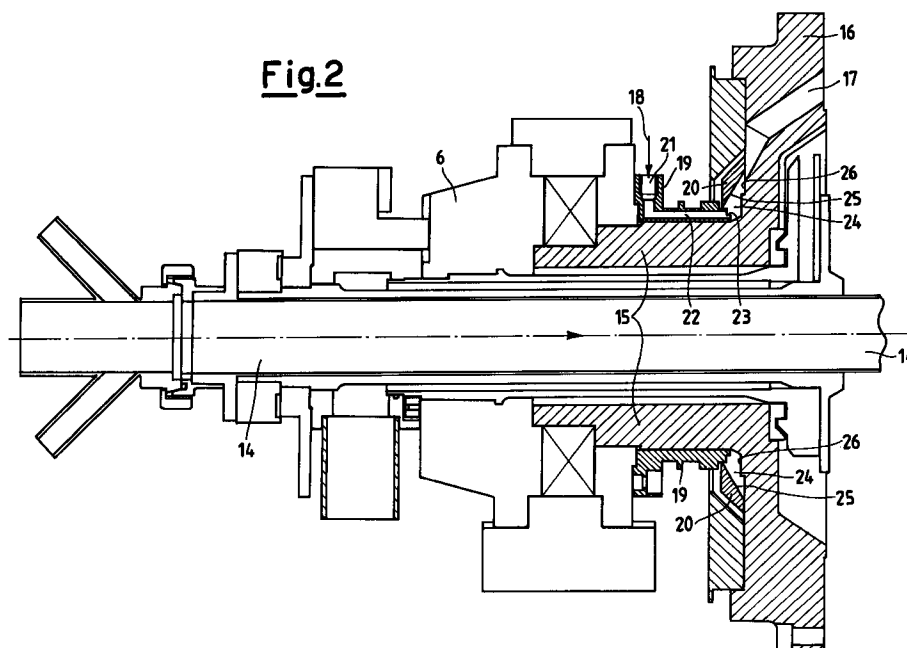
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(54) **A centrifugal separator for olive oil**

(57) In a centrifugal separator for separating the liquid and solid phases of a paste of crushed olives, the separator comprises a drum (5, 6) rotating about a horizontal axis and closed on one side by a ring member (15) having a radial flange (16) through which there are formed channels (17) for expelling water extracted from the olives. The centrifugal separator incorporates a washing device (18) comprised of stationary means

(19) for supplying a water jet to clear the channels (17) and centrifugating means (20) fast for rotation with the radial flange (16). The centrifugating means centrifugate the water jet and delivering the centrifugated water jet into the channels (17) during operation of the centrifugal separator.



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Description

Field of the invention

The present invention falls within the field of centrifugal separators for olive oil. More particularly, the invention relates to a centrifugal separator incorporating a washing device for clearing the channels for expelling the water coming from crushed olives and separated from the other phases of a paste of crushed olives.

Background of the invention

In the food industry it is well known to use centrifugal separators for extracting olive oil. These separators exploit the centrifugal separation principle to separate a composite mixture consisting of a paste of crushed olives into its components (oil, water, solid fraction). The separated components are then collected at distinct zones of the separator.

Conventional centrifugal separators comprise a central supply tube in which a crushed olive paste is let in. Around the central supply tube there is mounted a rotating drum composed by the union of a cylindrical drum portion and an adjacent truncated cone drum portion.

Rotation of the drum causes the components to separate from each other in accordance with their specific gravity. The solid phase, being the heaviest, forms a radially outer layer on the wall of the drum, particularly in the cylindrical portion thereof of greater diameter. The liquids, oil and water, stratify radially in cylindrical coaxial layers in the radially innermost zone of the drum.

The various separated phases are expelled from zones of the separator drum at axially different locations. The olive water is expelled from one side of the separator where there are provided radially oriented or inclined channels. These channels are likely to occlude because of solid particles in suspension in the olive water and which tend to accumulate. The risk of an occlusion occurring is greater in particular when the centrifugal separator is set to work with a low water content, as in such a case the water is dense with solid material.

Occlusion of the water expelling channels stops the separator from working. To restart a conventional centrifugal separator it is therefore necessary to stop the machine, remove parts of the separator to clear the channels, mount the removed components again and start the separator off again. As such servicing may be required several times in a day, this clearly requires an expenditure of time resulting in an increase of costs reduces the production.

Summary of the invention

Accordingly, it is a primary object of the present invention to overcome one or more disadvantages and limitations of the prior art.

Toward the attainment of this and additional objects and advantages, the present invention, briefly summarised, provides a centrifugal separator for separating the liquid and solid phases of a paste of crushed olives, the separator comprising a drum rotating about a horizontal axis and closed on at least one side by a ring member having a radial flange through which there are formed channels for expelling water extracted from the olives, characterised by comprising a washing device, the washing device comprising

stationary means for supplying a water jet to clear said channels and

centrifugating means fast for rotation with said radial flange for centrifugating said water jet and delivering said centrifugated water jet into said channels during operation of the centrifugal separator.

Brief description of the drawings

In order that the present invention may be well understood there will now be described a preferred embodiment thereof, given by way of example, reference being made to the accompanying drawings, in which:

- FIG. 1 is a schematical side view of a centrifugal separator fitted with a washing device according to the present invention; and
FIG. 2 is an axial cross sectional view, to an enlarged scale, of the centrifugal separator of FIG. 1 showing the washing device.

Detailed description a preferred embodiment

With reference initially to FIG. 1, a centrifugal separator is fitted with a base 2 mounted on a bed 1 through vibration dampers 3. A rotating drum, composed by the union of a cylindrical drum portion 5 adjacent to a truncated-cone drum portion 6 performs separation of the liquid and solid phases from a paste of crushed olives being pumped into a central supply tube 14, shown in FIG. 2.

Referring to FIG. 2, a rotating ring member 15 forms a radial flange 16 closing one side of the drum 5, 6. Obtained in radial flange 16 are inclined channels 17 for expelling water. The inclined channels 17 are circumferentially equally spaced about the central axis of rotation of ring member 15.

In accordance with the present invention, the centrifugal separator incorporates a washing device 18 for removing agglomerates of solid particles suspended in the water and capable of depositing within the channels 17 or even occluding same. The washing device 18 consists of a stationary body 19 supplying a water jet, and a rotating annular body 20 for centrifugating and deflecting the water jet coming out of the stationary body 19,

as specified herein after.

Preferably, the stationary body 19 is of annular shape and disposed around the cylindrical portion of ring member 15 proximate to the inclined channels 17. The stationary body 19 incorporates an inlet 21 for water supplied by an external delivering apparatus (not shown) and an axial conduit 22 ending with an outlet aperture 23 at the junction of the radial flange 16 and the cylindrical portion of ring member 15, at the inlet side of channels 17.

The rotating annular body 20 is fixed to the radial flange 16 or any other part fast for rotation with flange 16. The shape of rotating annular body 20 in axial cross section is such as to define an annular chamber 24 with radial flange 16. The annular chamber 24 is in fluid communication with the inclined channels 17. The rotating annular body 20 has a conical wall 25 diverging in the direction of channels 17. Conical wall 25 forms the radially outer part of annular chamber 24 in order to centrifugate the washing water supplied through the water supplying stationary body 19 and introduce a centrifugated and pressurised water jet into the inclined channels 17. The water is also pressurised as the conical wall 25 ends proximate to a radial wall 26 of radial flange 16, wherein the mutual disposition between the outer end portion of conical wall 25 and the radial wall 26 is suitably chosen as to provide a throttling in the radially outer portion of annular chamber 24.

Therefore, in any moment, an operator can send a jet of pressurised water into the inclined channels for expelling the water extracted from the olives, still keeping the centrifugal separator working. Advantageously, this operation can be carried out without slowing down the rotational speed of the machine, generally about 3,000 rpm, clearing the inclined channels and achieving the above mentioned objects.

While a specific embodiment of the invention has been disclosed, it is to be understood that such disclosure has been merely for the purpose of illustration and that the centrifugal separator is not to be limited in any manner thereby. Various modifications will be apparent to those skilled in the art in view of the foregoing example.

Claims

1. A centrifugal separator for separating the liquid and solid phases of a paste of crushed olives, the separator comprising a drum (5, 6) rotating about a horizontal axis and closed on at least one side by a ring member (15) having a radial flange (16) through which there are formed channels (17) for expelling water extracted from the olives, characterised by comprising a washing device (18), the washing device comprising

stationary means (19) for supplying a water jet to clear said channels (17) and

centrifugating means (20) fast for rotation with said radial flange (16) for centrifugating said water jet and delivering said centrifugated water jet into said channels (17) during operation of the centrifugal separator.

2. A centrifugal separator as claimed in claim 1, characterised in that centrifugating means comprise an annular body (20) fixed for rotation with said radial flange (16), said annular body (20) being so shaped as to define an annular chamber (24) in fluid communication with said channels (17).
3. A centrifugal separator as claimed in claim 2, characterised in that said rotating annular body (20) provides a conical wall (25) diverging in the direction of said channels (17), said conical wall forming the radially outer part of said annular chamber (24).
4. A centrifugal separator as claimed in claim 3, characterised in that said conical wall (25) ends proximate to a radial wall (26) of radial flange (16), said conical and radial walls (25, 26) defining a throttling in the radially outer portion of said annular chamber (24), whereby centrifugated and pressurised water delivered into said channels (17).
5. A centrifugal separator as claimed in claims 1 and 2, characterised in that water supplying stationary means (19) comprise a conduit (22) ending with an aperture (23) into said annular chamber (24).
6. A centrifugal separator as claimed in claim 5, characterised in that said conduit (22) is in fluid communication with an external water delivering apparatus manually controlled by an operator during operation of the centrifugal separator.

Fig.1

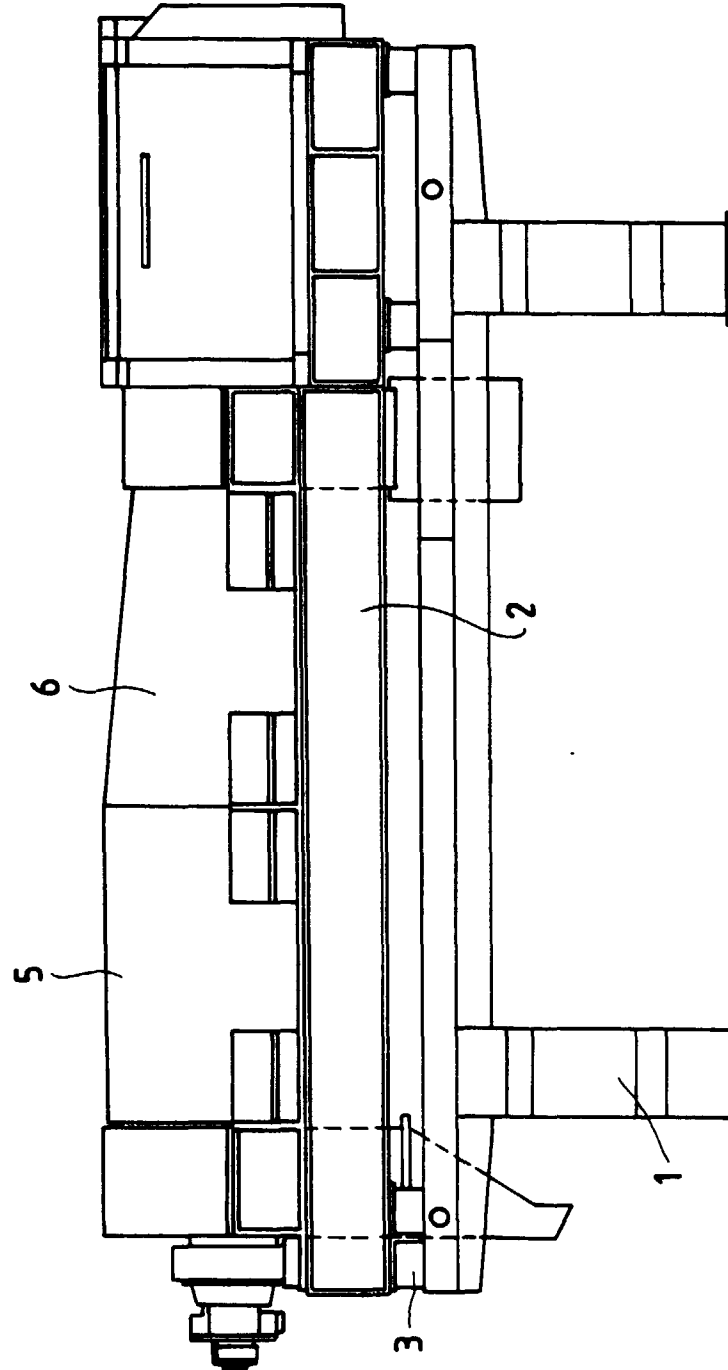
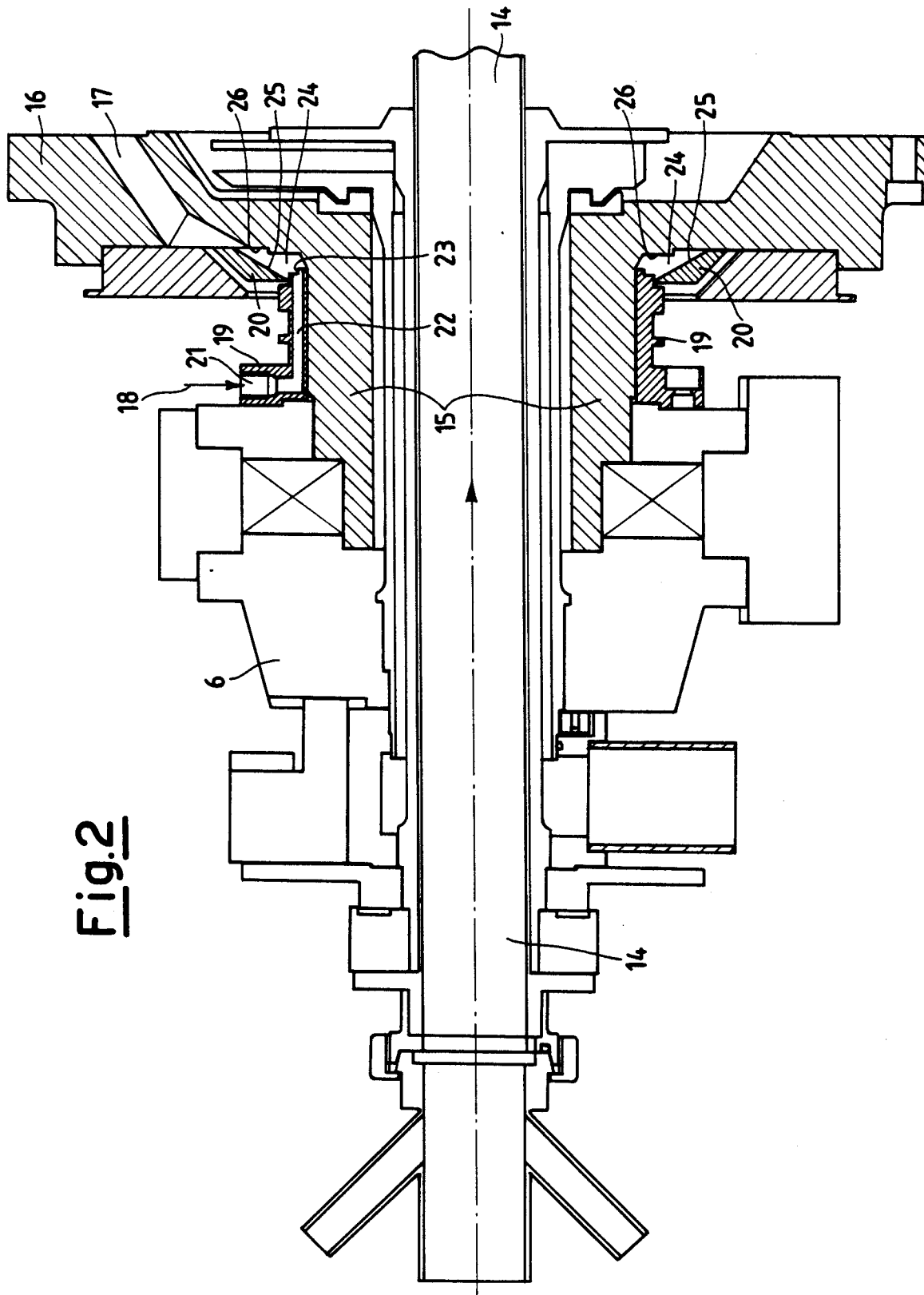


Fig.2





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EUROPEAN SEARCH REPORT

Application Number
EP 97 12 0723

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)
A	FR 2 175 862 A (KLÖCKNER-HUMBOLDT-DEUTZ) * the whole document *	1	B04B15/06 B04B1/20
A	US 5 397 471 A (J.R. RODEBUSH) * abstract; figures 1-3 *	1	
A	US 3 854 658 A (H. PROBSTMEYER)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B04B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 6 February 1998	Examiner Leitner, J
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