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(54) **Oil mill for crushing/pressing olives or the like**

(57) An oil mill (1) for crushing/pressing olives or the like comprises a supporting structure (2) defining a pressing tank (3) surrounded by a peripheral edge (4). At least one wheel (5) is rotatably mounted in the pressing tank (3) defined by the supporting structure (2). A closing el-

ement (8) has a peripheral closing edge (9) cooperating with the peripheral edge (4) of the supporting structure (2) to define a chamber (10) containing the pressing tank (3) and the at least one wheel (5). The chamber (10) is suitable for application of a modified atmosphere.

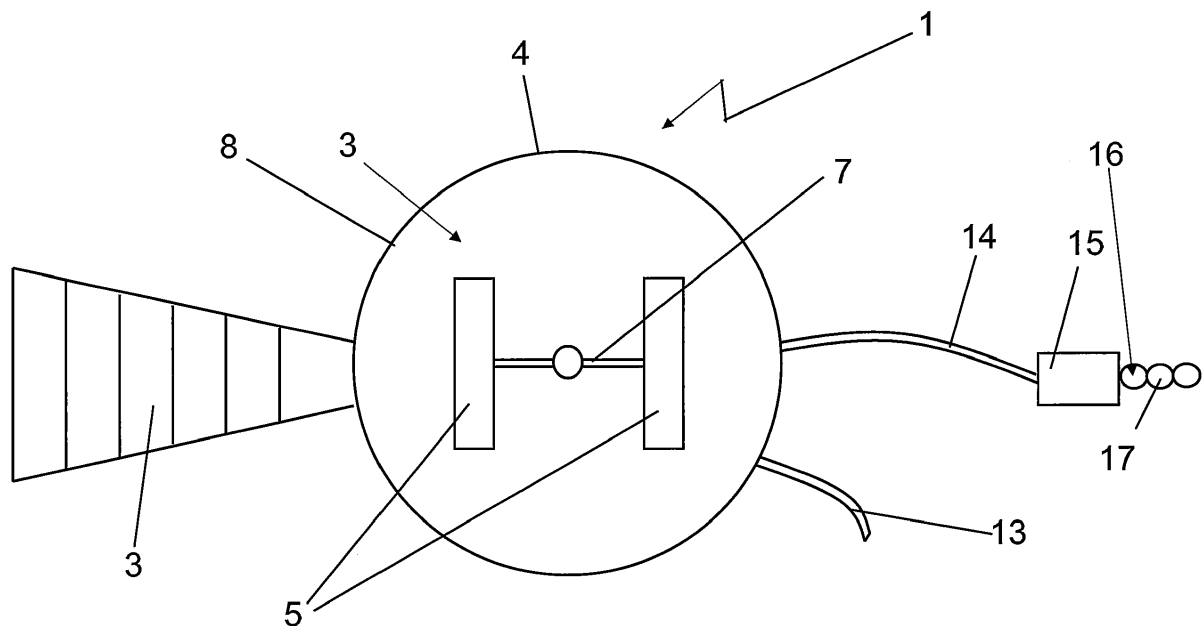


FIG. 1

Description

[0001] The present invention relates to an oil mill for crushing/pressing olives or the like.

[0002] With reference to the extraction of oil from olives the use of oil mills for performing a first actual extraction stage is known, wherein the olives are subjected to mechanical actions that cause the breakage of the cell wall and the membranes with the consequent leakage of cell juices and oil.

[0003] Thanks to the rubbing of the fragments of the stone on the pulp or the impact of mechanical devices rotating at high speed in the mass of pulp an olive paste is obtained defined by a semi-fluid mass composed of a solid fraction (fragments of stones, skin and pulp) and a liquid fraction (emulsion of water and oil).

[0004] In the oil mill according to the present invention such rubbing is obtained through the use of stone wheels whose job is to crush the stones into suitable sizes to generate a rubbing action of the sharp edges of the fragments of stone on the olive pulp and to remix the mass being processed.

[0005] A traditional oil mill comprises a tank provided with raised edges and a system with 2-6 stone wheels with a horizontal axis, arranged in pairs at different distances with respect to the vertical axis of the tank. Each wheel is raised by a few millimetres with respect to the bottom of the tank and is adjustable so as to obtain fragments of stone of a suitable size.

[0006] An oil mill with stone wheels as described above is suitable for the extraction of very high quality oils wherein the negative phenomena are sought to be eliminated or reduced. The oxidation of the olive paste due to exposure to air is one of the negative phenomena and can have a significant effect.

[0007] In fact, limiting or reducing the oxidation of the olive paste due to exposure to air during crushing/pressing with stone wheels (grindstones) is a requirement that has been apparent for a long time and still remains unresolved.

[0008] In this context, the technical objective underlying the present invention is to provide an oil mill for crushing/pressing olives or the like which obviates the drawbacks in the prior art as described herein above.

[0009] In particular, the object of the present invention is to provide an oil mill for crushing/pressing olives or the like that can produce very high quality oils limiting or reducing oxidation also during the crushing/pressing stage.

[0010] A further object of the present invention is to propose an oil mill for crushing/pressing olives and the like that does not dramatically change the structure of traditional oil mills, which is simple to produce and use.

[0011] The set technical task and aims are substantially attained by an oil mill for crushing/pressing olives and the like, comprising the technical characteristics set out in one or more of the appended claims. The dependent claims correspond to different embodiments of the invention.

[0012] In accordance with one aspect, the present invention relates to an oil mill for crushing/pressing olives or the like comprising a supporting structure defining a pressing tank surrounded by a peripheral edge; at least one wheel rotatably mounted in the pressing tank defined by the supporting structure; a closing element having a peripheral closing edge cooperating with the peripheral edge of the supporting structure to define a chamber containing the pressing tank and the at least one wheel, said chamber being suitable for application of a modified atmosphere.

[0013] Envisaging the production of a chamber through the use of a closing element that closes that pressing tank from above the formation of a modified atmosphere is possible with the introduction of inert gas, nitrogen for example, therefore preventing the oxidation of the olive paste (or in general of the result of crushing/pressing) during grinding.

[0014] With reference to the aforementioned aspect, the present invention can also have one or more of the preferred characteristics that are described herein below. Preferably said closing element is in the form of a dome. This shape simplifies the structure and the production of the closing element.

[0015] Preferably said peripheral edge of the supporting structure and said peripheral closing edge are circular. This characteristic allows the optimisation of the seal between the supporting structure and the closing element. Preferably a gasket is envisaged disposed at the peripheral edge of the supporting structure, wherein said gasket is made of metal and rubber, for example. This optimises the seal and simplifies the structure.

[0016] Preferably said closing element and/or said supporting structure comprises a loading opening in communication with said chamber. Alternatively means are provided for raising the closing element during the loading of the supporting structure. One or the other of the two systems enables the loading of the pressing tank to be facilitated.

[0017] Preferably a loading ramp is envisaged terminating at the peripheral edge of the supporting structure, preferably at the loading opening in communication with said chamber. This aspect also facilitates the loading of the pressing tank.

[0018] Preferably said supporting structure comprises an unloading pipeline for the result of crushing/pressing. The position of the unloading pipeline on the supporting structure enables the structure of the closing element to be kept compact.

[0019] Preferably a pipeline is envisaged connected, by a pump for example, to a tank of inert gas, nitrogen for example, wherein said pipeline opens into said chamber preferably at a gasket disposed at the peripheral edge of the supporting structure. This facilitates the formation of a modified atmosphere suitable to prevent the oxidation of the product of crushing/pressing.

[0020] Preferably said closing element is made of glass and/or plastic material for food.

[0021] Preferably said at least one wheel is rotating around a horizontal axis or an axis inclined to a horizontal axis, said pressing tank defining a horizontally-disposed pressing plane.

[0022] Further characteristics and advantages of the present invention will become more apparent from the following indicative, and hence non-limiting, description of a preferred, but not exclusive, embodiment of an oil mill for crushing/pressing olives and the like, as illustrated in the appended drawings, in which:

- Figure 1 is a schematic view from above of an oil mill for crushing/pressing olives and the like according to the present invention;
- Figure 2 is a schematic front view of the oil mill for crushing/pressing olives and the like of Figure 1.

[0023] With reference to the appended figures, 1 indicates an oil mill for crushing/pressing olives and the like as a whole. Below explicit reference will be made to an oil mill for crushing/pressing olives and the like for the extraction of oil.

[0024] In particular the oil mill according to the present invention is an oil mill with stone wheels or grindstones comprising a supporting structure 2.

[0025] The supporting structure 2 may for example be tapered, as illustrated in the appended figures.

[0026] The supporting structure 2 defines a pressing tank 3.

[0027] The pressing tank 3 is surrounded by a peripheral edge 4, preferably circular. In particular the pressing tank is provided with raised edges. Within the pressing tank 3, a horizontally disposed pressing plane is defined.

[0028] At least one wheel 5 or grindstone is rotatably mounted in the pressing tank 3 defined by the supporting structure. Preferably the at least one wheel 5 is rotating around a horizontal axis or an axis inclined to a horizontal axis or to the pressing plane. Preferably two to six stone wheels with a horizontal axis are arranged in pairs at different distances with respect to a vertical axis 6 of the tank. In the example illustrated, by way of example, a pair of wheels has been envisaged connected by a common shaft 7.

[0029] The wheels or grindstones are made of stone.

[0030] The oil mill 1 further comprises a closing element 8 having a peripheral closing edge 9, preferably circular, cooperating with the peripheral edge 4 of the supporting structure 2. In particular the closing element is arranged above the pressing tank 3 and is resting and sealed onto the peripheral edge 4 of the supporting structure 2. In particular the connection between the closing element 8 and the supporting structure 2 is of the hermetic type.

[0031] The closing element 8 defines a chamber 10 containing the pressing tank 3 and the wheels 5.

[0032] The chamber 10 is suitable for the application of a modified atmosphere, in particular using nitrogen. In particular the chamber 10 is hermetically closed to the

external environment.

[0033] The closing element is preferably in the form of a dome. The closing element is preferably made of glass and/or plastic material for food.

5 **[0034]** In accordance with a possible embodiment, the oil mill 1 comprises a gasket 11 disposed at the joint between the supporting structure 2 and the closing element 8. Such gasket 11 is made of metal and rubber, for example.

10 **[0035]** The gasket 11 is therefore interposed between the peripheral edge 4 and the peripheral closing edge 9. In this case defining that the peripheral closing edge 9 "cooperates" with and is resting on the peripheral edge 4 it is understood that such an association can occur with the interposition of one or more additional elements, for example the gasket 10.

[0036] Advantageously the gasket 10 is connected to the supporting structure 2 and the closing element 8.

20 **[0037]** In accordance with one possible embodiment, one or more of the closing element 8 and/or the supporting structure 2 and/or the gasket 11 comprises a loading opening in communication with the chamber 10.

[0038] A loading ramp 12 terminates at the peripheral edge 4 of the supporting structure 2, preferably at the loading opening in communication with the chamber 10 for loading the olives into the pressing tank 3.

25 **[0039]** In accordance with one possible embodiment, the supporting structure 2 comprises an unloading pipeline 13 for the result of the crushing/pressing (olive paste). Preferably the unloading pipeline 13 is hermetically connected to the supporting structure.

30 **[0040]** Preferably the oil mill 1 comprises a pipeline 14 connected, for example through a pump 15, to a tank 16 of inert gas, nitrogen for example. In the illustrated example the tank 16 comprises one or more cylinders 17. In particular the pipeline 14 can open into the chamber 10 at the gasket 11 disposed at the peripheral edge 4 of the supporting structure 2. The connection between the gasket 11 and the pipeline 14 is hermetically sealed.

35 **[0041]** The mixture of nitrogen will be regulated so as to obtain a saturated environment and exclude the presence of oxygen according to the optimal parameters of the process.

40 **[0042]** The oil mill according to the present invention has the double advantage of exploiting the stone pressing system, still considered the best way to crush and mix the olives, and that of removing oxygen from the mixture: oxygen, as is known in the prior art, is the oxidising element, harmful to the quality of the finished product.

Claims

- 55 1. Oil mill (1) for crushing/pressing olives or the like, comprising:
- a supporting structure (2) defining a pressing tank (3) surrounded by a peripheral edge (4);

- at least one wheel (5) rotatably mounted in the pressing tank (3) defined by the supporting structure (2);
 - a closing element (8) having a peripheral closing edge (9) cooperating with the peripheral edge (4) of the supporting structure (2) to define a chamber (10) containing the pressing tank (3) and the at least one wheel (5), said chamber (10) being suitable for application of a modified atmosphere. 10
2. Oil mill (1) as claimed in claim 1, wherein said closing element (8) is in the form of a dome.
 3. Oil mill (1) as claimed in claim 1 or 2, wherein said peripheral edge (4) of the supporting structure (2) and said peripheral closing edge (9) are circular. 15
 4. Oil mill (1) as claimed in one or more of the preceding claims, comprising a gasket (11) disposed at the peripheral edge (4) of the supporting structure (2), wherein said gasket (11) is made of metal and rubber, for example. 20
 5. Oil mill (1) as claimed in one or more of the preceding claims, wherein one or more of said closing element (8) and/or supporting structure (2) and/or gasket (11) comprises a loading opening in communication with said chamber (10). 25
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 6. Oil mill (1) as claimed in one or more of the preceding claims, comprising a loading ramp (12) terminating at the peripheral edge (4) of the supporting structure (2), preferably at the loading opening in communication with said chamber (10). 35
 7. Oil mill (1) as claimed in one or more of the preceding claims, wherein said supporting structure (2) comprises an unloading pipeline (13) for the result of pressing/crushing. 40
 8. Oil mill (1) as claimed in one or more of the preceding claims, comprising a pipeline (14) connected, by a pump (15) for example, to a tank (16) of inert gas, nitrogen for example, wherein said pipeline (14) opens into said chamber (10) preferably at a gasket (11) disposed at the peripheral edge (4) of the supporting structure (2). 45
 9. Oil mill (1) as claimed in one or more of the preceding claims, wherein said closing element (8) is made of glass and/or plastic material for food. 50
 10. Oil mill (1) as claimed in one or more of the preceding claims, wherein said at least one wheel (5) is made of stone and preferably is rotating around a horizontal axis or an axis inclined to a horizontal axis, said pressing tank (3) defining a horizontally-disposed pressing plane. 55
 11. Oil mill (1) for crushing/pressing olives or the like as claimed in one or more of the preceding claims, wherein said closing element (8) is such disposed that it rests on the supporting structure (2), preferably on a gasket (11), so as to generate a hermetically sealed connection.

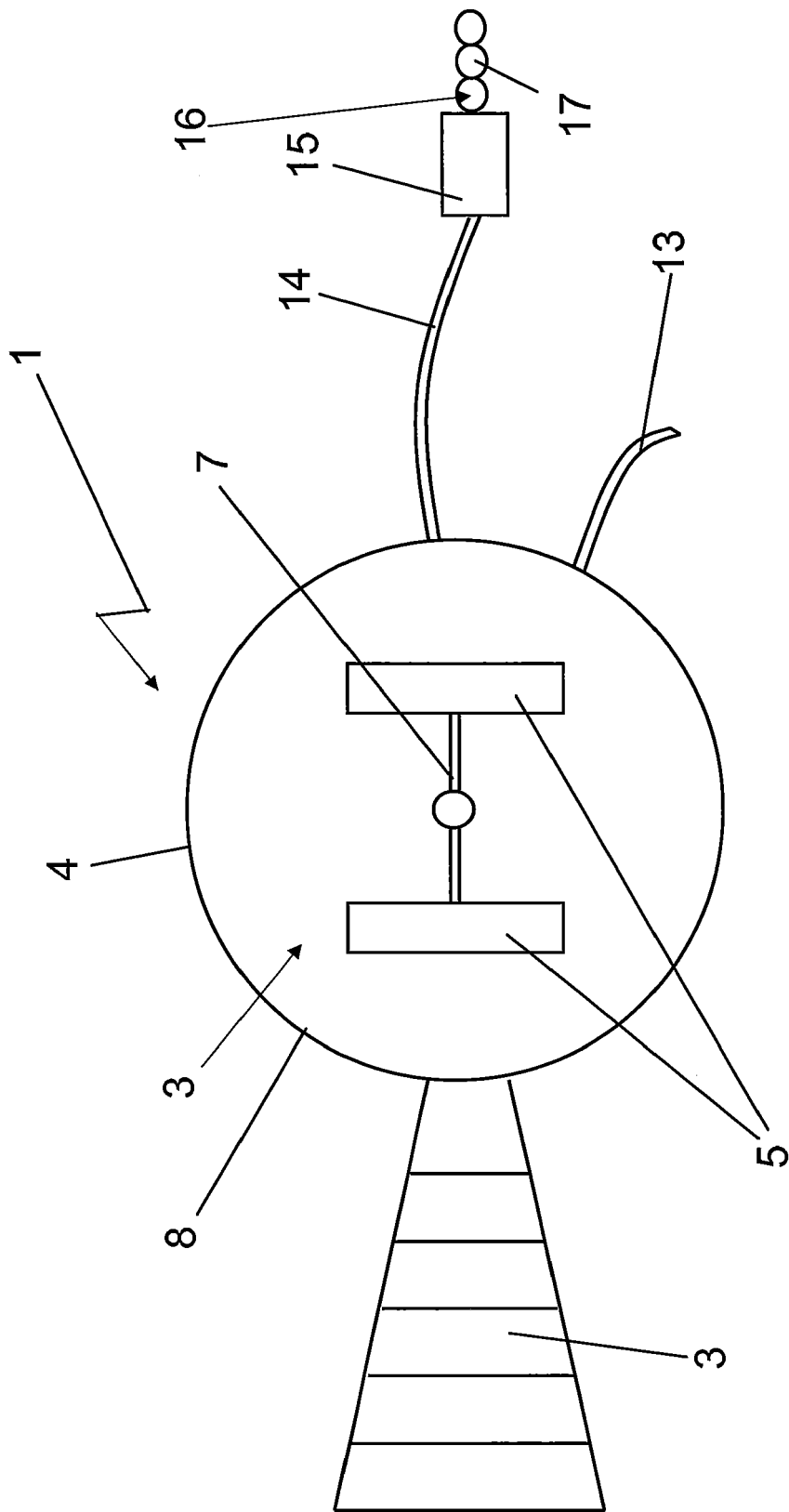


FIG. 1

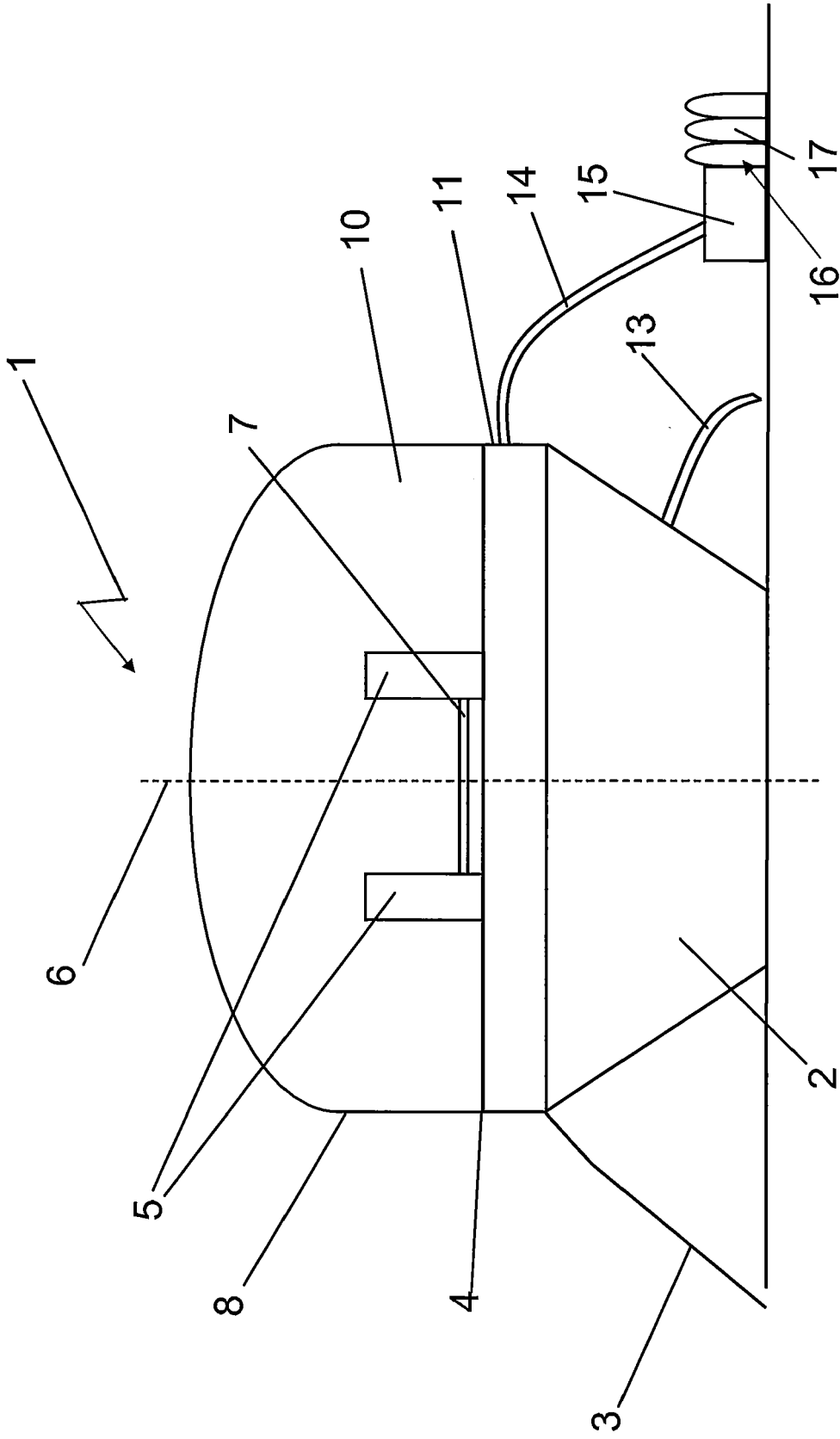


FIG. 2



EUROPEAN SEARCH REPORT

Application Number
EP 13 15 2506

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B02C
Place of search Munich		Date of completion of the search 1 March 2013	Examiner Strodel, Karl-Heinz
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82