



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
29.08.2007 Bulletin 2007/35

(51) Int Cl.:
B24B 31/108 (2006.01) B24B 31/12 (2006.01)

(21) Application number: **06425127.5**

(22) Date of filing: **28.02.2006**

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

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(54) **Centrifugal finishing machine**

(57) Finishing machine comprising a container (1) and a rotor (2) which can rotate in the container (1) around a substantially vertical axis for centrifuging material to be treated, wherein the upper portion (1a) of the container (1) arranged above the rotor (2) is connected to the lower portion (1b) of the container (1) arranged under the rotor (2) through one or more openings (5) and is connected

by means of at least one inlet (8) to air heating means (10), while the lower portion (1b) of the container (1) is connected to at least one outlet (11), wherein said inlet (8) and/or said outlet (11) are provided with first ventilation means (9) and/or second ventilation means (12), respectively, for generating in the container (1) a hot airflow through said openings (5).

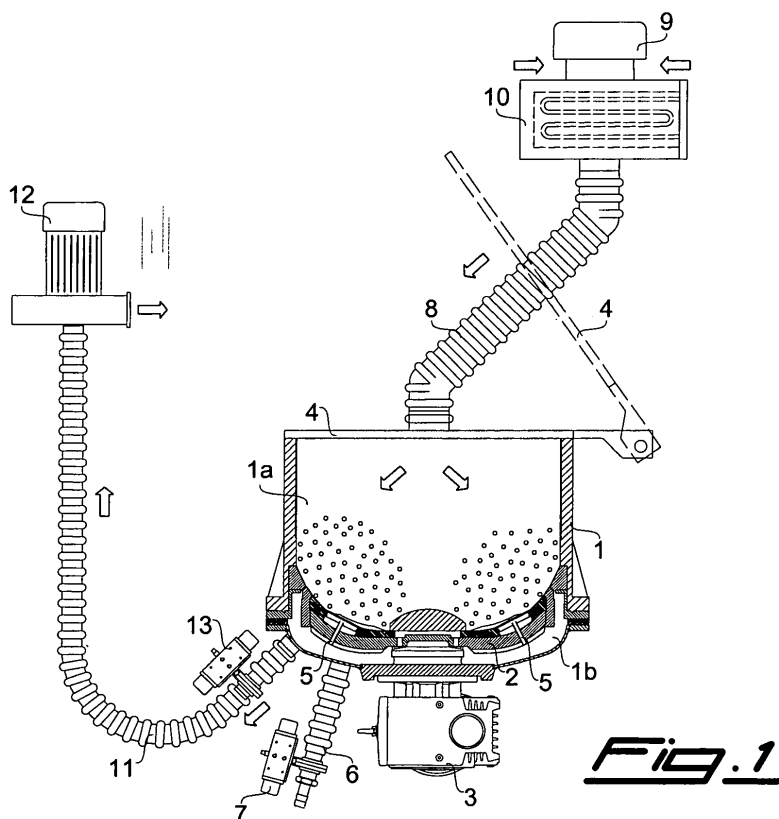


Fig. 1

Description

[0001] The present invention relates to a centrifugal finishing machine, and in particular to a centrifugal machine provided with means for drying the material contained therein.

[0002] Known finishing machines comprise a cylindrical container and a rotor which can rotate in the container around a substantially vertical axis for centrifuging the material to be treated, wherein the upper portion of the container is connected to its lower portion through one or more openings for draining the treatment liquids after their use. Said openings generally consists of the circular slit which separates the rotor from the inner wall of the container. In these known machines, the material in the container cannot be dried by heating after the drainage of the liquids, since the inner wall of the container and the upper wall of the rotor are made of an elastomeric material which significantly expands with the heat, with consequent closure of said slit and risk of damages. Therefore, said material is dried outside the machine with other means.

[0003] It is therefore an object of the present invention to provide a machine free from said disadvantages. Said object is achieved with a machine, the main features of which are disclosed in the first claim and other features are disclosed in the subsequent claims.

[0004] Thanks to the particular hot air system which exploits said draining openings for the circulation of the air, the machine according to the present invention can dry the material directly in its container, so as to reduce the working times and costs.

[0005] According to a particular aspect of the invention, the container and the rotor are provided with particular collars which prevent damages due to the closure of said slit by thermal dilatation.

[0006] According to another particular aspect of the invention, the rotor can be vertically moved and is crossed by further openings covered by particular perforated plugs, so as to improve the efficiency of the machine according to the material treated therein.

[0007] Further advantages and features of the machine according to the present invention will become clear to those skilled in the art from the following detailed and non-limiting description of an embodiment thereof with reference to the attached drawings, wherein:

- figure 1 shows a vertical sectioned view of the machine;
- figure 2 shows an enlarged view of the container of the machine of figure 1; and
- figure 3 shows a view sectioned along plane III-III of figure 2.

[0008] Referring to figure 1, it is seen that the finishing machine according to the present invention comprises in a known way a container 1 having a substantially cylindrical shape and a rotor 2 which can rotate in the bottom

of container 1 around a substantially vertical axis by means of a motor 3 for centrifuging the material to be treated (shown in figure 1 which small spheres). A removable cover 4 closes container 1 from the top. The upper portion 1a of container 1 arranged above rotor 2 is connected to the lower portion 1b of container 1 arranged under rotor 2 through one or more openings 5 for draining the finishing liquids used during the centrifugation of the material through at least one drain 6 which is connected to the lower portion 1b and is provided with a drain valve 7.

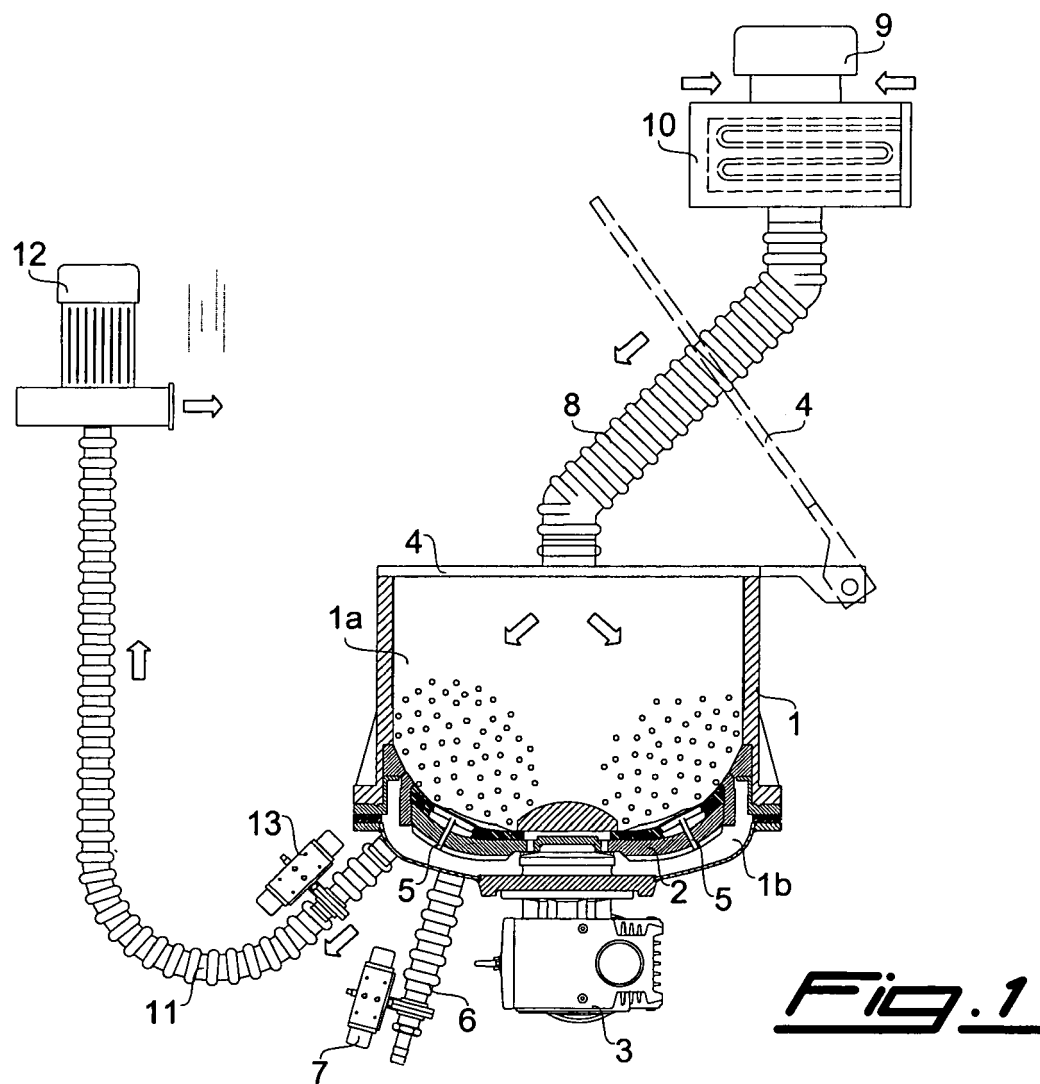
[0009] According to the invention, the upper portion 1a of container 1 is connected by means of at least one inlet 8 to first ventilation means 9, in particular a first ventilator, provided with heating means 10, in particular electric, of the air sucked by the first ventilation means 9, while the lower portion 1b of container 1 is connected by means of at least one outlet 11 to second ventilation means 12, in particular a second ventilator, in addition or in alternative to said first ventilation means 9, so as to generate in container 1 a hot airflow through openings 5. Preferably, outlet 11 is provided with an outlet valve 13 and inlet 8 leads to an opening made in cover 4. The air circulation in the machine according to the present invention is shown by the arrows.

[0010] Referring also to figures 2 and 3, it is seen that the upper surface of rotor 2 is substantially concave and is coated by a layer 14 made of an elastomeric material. Rotor 2 comprises a plurality of openings 5, for example four openings, which consist of through holes in the body of rotor 2 and are covered by metal plugs 15 provided with a plurality of smaller holes. The metal plugs 15 are substantially frustoconical and can be substituted with other plugs having the same outer shape but larger or smaller holes in proportion to the sizes of the material to be treated in container 1. A first collar 16 made of a material resistant to abrasion and with a low dilatability, in particular cast iron, steel, their alloys or ceramics, is fixed around rotor 2 for rotating with the latter. A second collar 17 made of a material resistant to abrasion and with a low dilatability, in particular cast iron, steel, their alloys or ceramics, is fixed to the inner wall of container 1 for surrounding the first collar 16, so that the thickness of slit 18 comprised between the first collar 16 and the second collar 17 remains substantially constant when the temperature in container 1 changes due to the air heated by the heating means 10, which can pass also through slit 18, besides openings 5. Preferably, slit 18 is inclined with an angle α comprised between 30° and 60° and rotor 2 is mounted on a vertically adjustable support, so that slit 18 can be narrowed or widened according to the sizes of the material to be treated by lifting or lowering, respectively, rotor 2.

[0011] Possible variations and/or additions may be made by those skilled in the art to the hereinabove described and illustrated embodiment of the invention while remaining within the scope of the following claims.

Claims

1. Finishing machine comprising a container (1) and a rotor (2) which can rotate in the container (1) around a substantially vertical axis for centrifuging material to be treated, wherein the upper portion (1a) of the container (1) arranged above the rotor (2) is connected to the lower portion (1b) of the container (1) arranged under the rotor (2) through one or more openings (5), **characterized in that** the upper portion (1a) of the container (1) is connected by means of at least one inlet (8) to air heating means (10), while the lower portion (1b) of the container (1) is connected to at least one outlet (11), wherein said inlet (8) and/or said outlet (11) are provided with first ventilation means (9) and/or second ventilation means (12), respectively, for generating in the container (1) a hot airflow through said openings (5). 5 10 15
2. Finishing machine according to the previous claim, **characterized in that** a first collar (16) made of a material resistant to abrasion and with a low dilatability is fixed around the rotor (2) for rotating with the latter, while a second collar (17) made of a material resistant to abrasion and with a low dilatability is fixed to the inner wall of the container (1) for surrounding the first collar (16). 20 25
3. Finishing machine according to the previous claim, **characterized in that** the slit (18) comprised between the first collar (16) and the second collar (17) is inclined with an angle (a) comprised between 30° and 60°. 30
4. Finishing machine according to one of the previous claims, **characterized in that** the rotor (2) is mounted on a vertically adjustable support. 35
5. Finishing machine according to one of the previous claims, **characterized in that** the inlet (8) leads to an opening made in a removable cover (4) which closes the container (1). 40
6. Finishing machine according to one of the previous claims, **characterized in that** the rotor (2) comprises a plurality of openings (5) which cross the body of the rotor (2) and are covered by removable plugs (15) provided with a plurality of holes. 45
7. Finishing machine according to the previous claim, **characterized in that** the removable plugs (15) are substantially frustoconical. 50
8. Finishing machine according to one of the previous claims, **characterized in that** the outlet (11) is provided with an outlet valve (13). 55
9. Finishing machine according to one of the previous claims, **characterized in that** the upper surface of the rotor (2) is substantially concave and is coated by an elastomeric layer (14).
10. Finishing machine according to one of the previous claims, **characterized in that** a drain (6) is connected to the lower portion (1b) of the container and is provided with a drain valve (7).



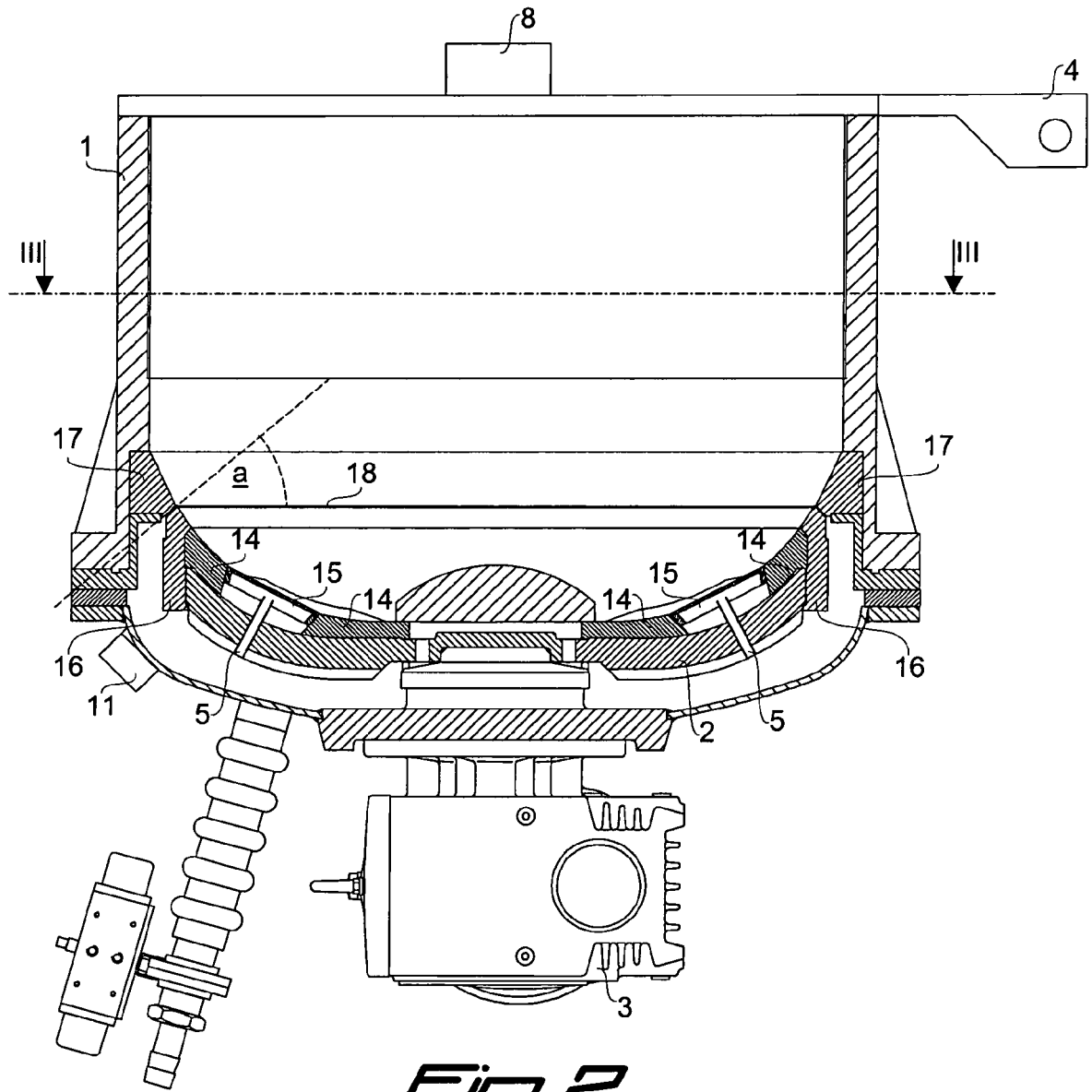


Fig. 2

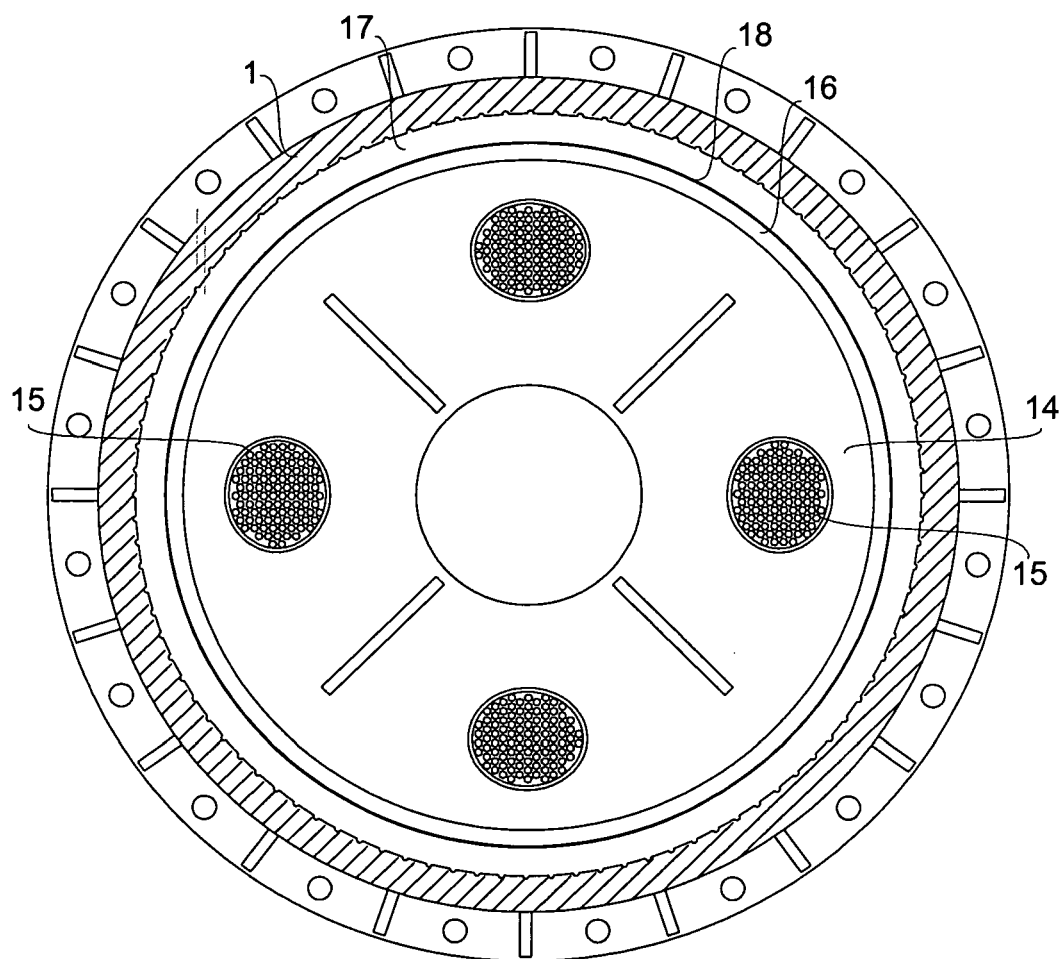


Fig. 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 42 5127

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B24B
Place of search		Date of completion of the search	Examiner
The Hague		10 July 2006	Garella, M
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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EP 06 42 5127

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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10-07-2006

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