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CONTINUOUS OPERATING CENTRIFUGE HAVING COAXIAL BASKETS ROTATING AT DIFFERENT SPEEDS

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FIG. 1

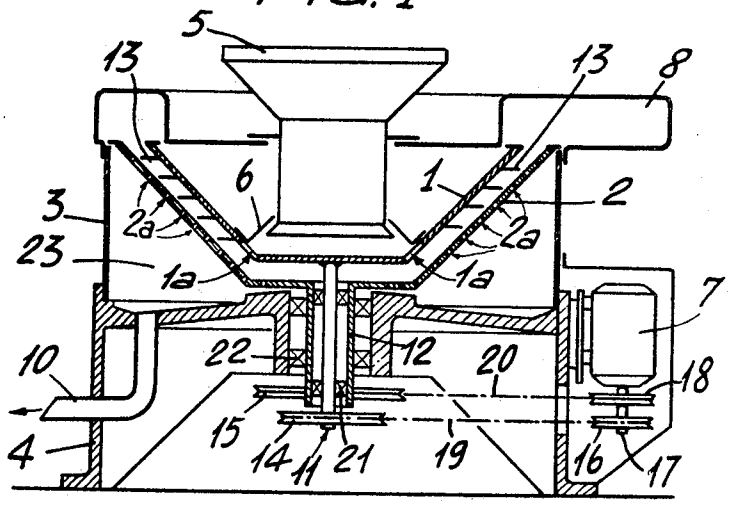
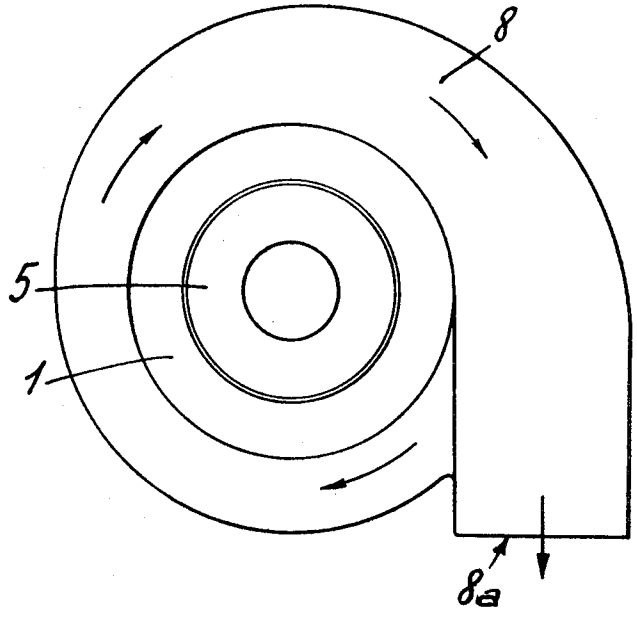


FIG. 2



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CONTINUOUS OPERATING CENTRIFUGE HAVING COAXIAL BASKETS ROTATING AT DIFFERENT SPEEDS

Berlando Lega and Giannangiolo Cecchi, both of Piazza Ferravilla 3, Milan, Italy

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ABSTRACT OF THE DISCLOSURE

A continuous operating centrifuge, particularly for textile flock processing, comprising two rotating coaxial baskets between which the material to be processed is caused to pass, said baskets being driven by control means causing rotation thereof at different speeds.

This invention relates to a continuous working centrifuge, particularly for textile flock processing.

More particularly, the present invention relates to a centrifuge of the above type, comprising two coaxial rotating baskets between which the material to be processed passes, said baskets being driven by control means for rotation thereof at different speeds; in the case, such speeds are also varying during the machine operation.

The accompanying drawing schematically shows by way of non-restrictice example an embodiment of the centrifuge according to the present invention, and more particularly:

FIG. 1 is an axial sectional view showing the centrifuge according to the invention.

FIG. 2 is a plan view of FIG. 1.

Referring to such figures, it will be seen that the centrifuge according to the present invention substantially comprises two coaxial baskets **1** and **2**, preferably of a frusto-conical shape and adapted to rotate within an outer casing **3** bearing on a base **4**.

Along the side surface and adjacent the bottom thereof, the inner frusto-conical basket **1** is provided with a plurality of holes **1***a* for conveying the material brought therein and to be processed, through the loading hopper **5** in the gap between said basket **1** and basket **2**. Basket **1** internally has an annular connecting piece **6** between hopper **5** and holes **1***a*, while externally having one or more thin plates or fins **13** radially projecting within said gap and helically extending. As shown in FIG. 1, the bottom hopper **5** has substantially the same diameter as the bottom wall of the inner basket **1**. Since the hopper **5** is stationary, the rotation of the inner basket **1** relative to the hopper causes material, such as flock, to migrate gradually around the circumference of the bottom wall due to the drag effect of the hopper on materials that that accumulate between the bottom wall of the inner basket and the bottom of the hopper **5**.

At the annular opening between the upper edges of said two baskets **1** and **2**, there is located a spirally extending collector **8** having a discharge opening **8***a* for the centrifuged material. Throughout its side surface, said basket **2** is provided with a plurality of holes **2***a* for discharging the liquid as removed by centrifugation; this liquid collects within chamber **23** defined by casing **3** and base **4** and outside drains through conduit **10**. At the bottom, said baskets **1** and **2** are fast with a shaft **11** and a hollow shaft **12**, respectively, said shafts **11** and **12** being coaxial to each other and respectively supported from base **4** by pairs of bearings **21** and **22**.

Shaft **11** is driven by driving shaft **17** projecting from

motor **7** through a belt drive **19** and pulleys **16** and **14** keyed on shafts **17** and **11**, respectively.

Similarly, shaft **12** is driven by said driving shaft **17** through a belt drive **20** and pulleys **18** and **15** keyed on shafts **17** and **12**, respectively.

The ratios for these two drives are different and moreover at least one of the pulleys for each drive (such as pulleys **14** and **15**) is adjustable to provide different pitch diameters by convetnional means (not shown) thus, the revolving speed for each of the two baskets can be varied also during centrifuging operation.

It will be understood that such drives can be also carried out in any other manner suitable to achieve the same objects.

Basket **1** and basket **2** concentrically rotate, but with different angular speeds, so as to allow a continuous and constant passage for the material which, as loaded through hopper **5** and by passing through the peripheral openings **1***a* of basket **1** due to centrifugal force, is urged or held on passing through the portion comprised between said two baskets in relation to the taper thereof and relative angle of friction for the material. The inclination of one or more helical thin plates or fins **13**, as arranged externally on the conical surface of basket **1**, is also a function of said angle.

The sizes of baskets **2** and **1** and respective arrangement of one or more helical thin fins **13** being set, the dwell time for the material within the machine and hence the flowrate therefor can be changed by changing the difference of angular speed between baskets **1** and **2**, as previously mentioned.

The material, after completion of its centrifugation time by passing through baskets **1** and **2**, is tangentially projected into collector **8**. The latter, due to its shape, on taking advantage of ventilation effect as created by the rotating baskets (various devices can be provided in order to increase such an effect), will discharge the material through its opening **8***a*. During centrifugation period, the liquid extracted from the material being treated is collected within chamber **23** between said outer casing **3** and exits through discharge conduit **10**.

In the drawing, the frusto-conical baskets **1** and **2** have been shown with the minor base at the bottom and the major base at the top. However, it is apparent that this arrangement could be reversed without departing from the inventive scope.

From the foregoing disclosure it will be apparent that the centrifuge according to the invention exhibits, as compared with known centrifuges, substantial advantages, the major of which being the following:

Reliable and continuous operation.

Capability of changing the machine flowrate by varying the speed differential between baskets **1** and **2** also when machine is operating.

Continuous increase in centrifugal force during material centrifugation, as theoretically required, owing to frusto-conical shape of the baskets.

Capability of idle starting the machine with a gradual balanced loading thereof.

No suspension requirements required owing to the balanced load automatically distributing between the two baskets.

Continuous discharge of the material at a soft and uncompacted state.

Modifications and changes can be made to the centrifuge according to the present invention without departing from the covering field of the invention.

What is claimed is:

1. A continuous operating centrifuge, particularly for textile flock processing, comprising: inner and outer rotary baskets, said baskets being mounted coaxially for

rotation, said baskets each having a substantially flat radial bottom wall and substantially frusto-conical sidewall, said sidewall of said outer basket being perforated, said bottom wall of said inner basket being imperforate and being spaced axially from the bottom wall of said outer basket, said sidewall of said inner basket being spaced radially inwardly from said frustro-conical sidewall of the outer basket, stationary hopper means positioned over the bottom wall of said inner basket for discharging flock into said inner basket, said sidewall of said inner basket having a plurality of discharge openings adjacent said bottom wall, and means for rotating said baskets at different speeds, whereby flock that is discharged from said hopper passes along said inner basket bottom wall and through said discharge openings into the annular space between the inner and outer baskets where it is progressively conveyed toward the top of the respective baskets.

2. A centrifuge according to claim 1, wherein the innermost basket externally has a plurality of radially projecting and helically extending thin fins.

3. A centrifuge according to claim 1, wherein at the annular opening between the edges of the major diameter for the two baskets a collector is located, said collector spirally extending and being provided with a discharge opening for the centrifuged material.

4. A centrifuge according to claim 1 wherein both drives for rotating said inner and outer baskets at different speeds are of the belt and pulley type, the ratios for said drive being different from each other.

5. A centrifuge according to claim 1 wherein said inner basket bottom wall is substantially continuous from said axis of rotation outwardly to the intersection with said sidewall.

6. A centrifuge according to claim 5 wherein said hopper has a discharge opening spaced above said bottom wall, said hopper being substantially coextensive with said bottom wall, whereby said hopper exerts a drag on material being rotated by said basket, thereby progressively moving material toward said openings in said sidewall.

References Cited

FOREIGN PATENTS

955,940	1/1957	Germany.
15,694	1890	Great Britain.

J. L. DECESARE, Primary Examiner

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210—377