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(54) **Title:** MODERN DECANter

(57) **Abstract:** A modern decanter is different from its predecessors of prior art in that it has no scroll. The modern decanter comprises a bowl (7) and a hood (10). The modern decanter is installed upright for normal operation. The slurry (1) is fed under either dynamic or static pressure in order to achieve the designed throughput and separation efficiency. Said slurry (1) is fed through a feed pipe (1A) from top of said decanter. Said bowl (7) is cylindrical and partially perforated. The perforation is fitted with nozzles (5). Said nozzles are shrouded with shrouds (6). Due to centrifugal force, the slurry (1) is separated into solid phase (4), heavy phase (2) and light phase (3). The solid phase (4) is discharged through nozzles (5), heavy phase (2) and light phase (3) are pushed upwards in the annular spaces of concentric pipes around the feed pipe (1A) and out through their respective outlet ports. The solid phase (4) is collected by hood (10) and subsequently drops down and out via spout (9). The nozzles and shrouds are flanged. Material, used for making the said shrouds, is oil resistant and slightly springy tough to provide good seal when fitted to the bowl perforation. The structure (8) holds the decanter firmly in transit and in normal operation.



Modern Decanter

5 Technical Field of the Invention

This invention relates to a decanter which does not have scroll for removing the solid phase. It has a partially perforated bowl and a hood shrouding the bowl. Solid phase is discharged through nozzles fitted to the perforation and collected by said hood and out via a spout.

10 Background of the invention

In the technology of the decanting slurry, a decanter has a scroll to remove the solid phase. The decanter bowl is part cylindrical and part tapered. The scroll is a screw conveyor is also part cylindrical and part tapered. The scroll pushes the solid phase from the bigger cylindrical section of the bowl to the smaller taper end. The solid phase is discharged at the
15 small end through a port designed for the purpose. While the light phase and heavy phase are discharged at the big end. The problems facing these types of decanter are that the wear and tear is excessive and speedy. The decanter bowl and the scroll are turning at different speeds. The scroll is spinning at much slower speed. The slurry inlet port and the scroll flights have fast and uneven wear. This has resulted in serious vibration and hence
20 the big end and small end bearings become defective requiring renewal at fairly high frequencies. At the same time the flights have to be rebuilt and/or metal sprayed with very high wear resistant metal powder or fitted with new high resistant tiles. Similarly the inlet port has to be rebuilt. Said repair works are major and can only be done in well equipped workshop and after repair the scroll must be dynamically balanced. This major repair
25 cannot be done on site. The workshop is normally far away from site. It therefore takes long time to complete a repair. It has therefore caused long downtimes hence affecting production quite badly. This leads to the present invention.

Summary of the invention

The decanter of this invention has no scroll. The removal of solid phase is done via a partially perforated decanter bowl. The perforation is fitted with nozzles which have very high wear resistance. The wear and tear is mainly on the nozzles. The renewal of the nozzles is simple and can be easily done in the factory in remote locations. Dynamic balancing is not necessary after the renewal. Vibration of the decanter is rare. There is only one set of bearings and these bearings last much longer. There is no frequent major repair. The solid phase generated is collected by a hood shrouding the decanter bowl. The decanter is installed upright for normal operation. The solid phase collected by the hood drops down and is discharged through a spout at the lower end of the hood. Slurry inlet is at the top. At the section where the slurry splashes out into the bowl at the end of the feed pipe, said section of the bowl is not perforated.

Description of Drawings

An embodiment of the present invention will now be described by way of example only with reference to the accompanying drawings in which:

Fig. 1 (A) shows the decanter installed at an upright position for normal operation.

Fig. 1 (B) shows the cross-sectional view of the decanter.

Fig. 1 (C) is an inset depicting a nozzle fitted to the bowl body.

Description of Preferred Embodiments

Fig. 1 (A) shows the explosion view of the decanter. The slurry (1) is fed into the decanter through a feed pipe (1A) and is discharged into the bowl (7) at the end of said pipe (1A).

The decanter bowl (7) is driven at high speed. This has resulted high centrifugal force. Due to the centrifugal force, the slurry (1) is separated into solid phase (4), heavy phase (2) and

light phase (3). The solid phase (4) of the slurry (1) is flung out through the nozzles (5) of said bowl (7). The heavy phase (2) and light phase (3) are forced to travel upwards via the annular spaces of concentric pipes to the feed pipe (1A) and are discharged through their
5 respective ports at the top of the decanter. This phenomenon occurs because the slurry (1) is fed into the decanter bowl (7) at some pre determined dynamic or static pressure to maintain the designed capacity of the decanter. Hood (10) collects the solid phase (4). Said solid phase (4) drops out via sprout (9) of the hood (10). Both nozzles (5) and nozzle shrouds (6) are flanged. The shrouds (6) are made of a slightly springy and tough material.
10 The material of the nozzle shrouds is oil resistant. The shrouded nozzles (5) are tight fitted to the perforation of the bowl (7). Structure (8) holds the decanter firmly while in transit and in operation.

Herein only limited embodiments used to illustrate the best mode contemplated to carry
15 out the invention. These embodiments are obvious to those skilled in the art. It is therefore that the invention is capable of other and different embodiments and its several details are of modifications in various aspects, none of which has departed from the invention.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A modern decanter comprising a bowl and a hood.
2. The modern decanter as claimed in claim 1 wherein said bowl is partially perforated.
- 5 3. The modern decanter as claimed in claim 1 wherein said hood shrouding said bowl, said hood collects solid phase generated by centrifugal force of said bowl spinning at high speed.
4. The modern decanter as claimed in claim 1 and 2 wherein the perforation of said bowl is fitted with nozzles.
- 10 5. The modern decanter as claimed in claim 1, 2 and 4 wherein said nozzles and nozzles shrouds are flanged, said nozzles and shrouds are fitted together in unison.
6. The modern decanter as claimed in claim 1 and 5 wherein said partially perforated bowl is fitted with unisons of nozzle and shroud.
7. The modern decanter as claimed in claim 5 and 6 wherein material of said shrouds is
15 oil resistant and slightly springy tough to provide good seal.
8. The modern decanter as claimed in preceding claims wherein the decanter is preferred to be installed upright for normal operation.

