

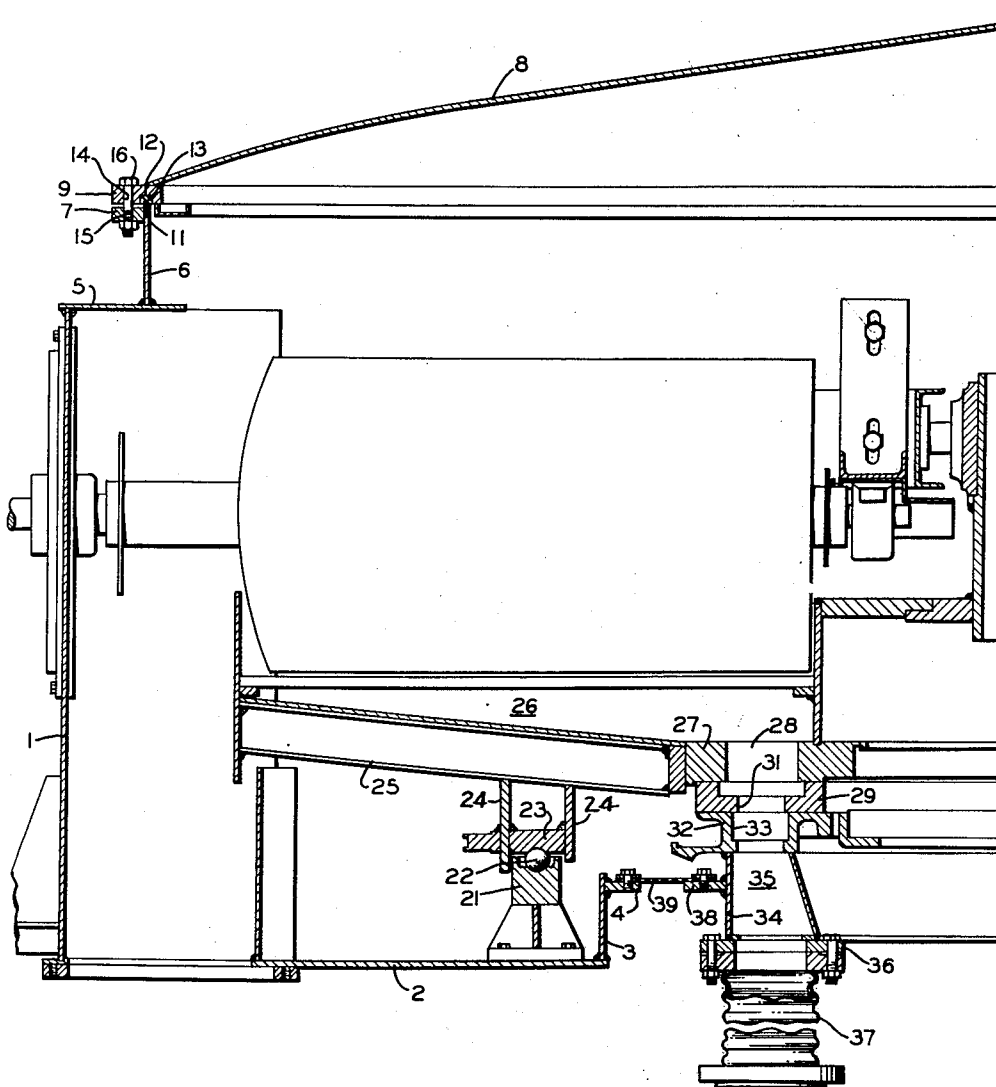
Dec. 31, 1957

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2,818,177

CONTINUOUS ROTARY FILTER

Filed Sept. 10, 1954



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2,818,177

CONTINUOUS ROTARY FILTER

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Application September 10, 1954, Serial No. 455,255

1 Claim. (Cl. 210—390)

This invention relates to and in general has for its object the provision of a hermetically sealed rotary table type of filter.

In many instances, it is desirable totally to enclose a continuous rotary table filter in order to prevent the egress of gases therefrom and although equipment of this character is not generally new, the sealing means presently resorted to is not entirely satisfactory for it involves effecting a seal between two relatively moving parts.

More specifically, it is the object of this invention to so construct a continuous rotary table type of filter that the filter per se can be sealed completely within its casing by the use of simple packing between the casing and its hood and by the use of a flexible diaphragm between the casing and a stationary portion of the filter valve.

The invention possesses other advantageous features, some of which, with the foregoing, will be set forth at length in the following description where that form of the invention which has been selected for illustration in the drawings accompanying and forming a part of the present specification, is outlined in full. In said drawings, one form of the invention is shown, but it is to be understood that it is not limited to such form, since the invention as set forth in the claims may be embodied in other forms.

Referring to the drawing, the single figure therein shown is a vertical mid-section of a continuous rotary table type filter embodying the objects of my invention.

The filter illustrated in this figure includes a generally cylindrical casing 1 provided at its lower end with a flat annular bottom 2. Welded to the inner circular edge of the bottom 2 is an upstanding inner rim 3 and welded to the upper edge of this rim is an inwardly extending flange 4. Sealed to the upper edge of the casing 1 is an inwardly extending plate 5 and welded to the upper face thereof is an upwardly extending cylindrical collar 6 provided with an outwardly extending flange 7.

Disposed over the cylindrical casing above described is an upwardly dished cover 8 provided with a peripheral flange 9 arranged to overlie both the flange 7 and the upper protruding edge 11 of the collar 6. Formed in the lower face of the flange 9 in vertical registration with the circular edge 11 is an annular channel 12 and disposed in said channel is a body of packing 13. Drilled in the mating flanges 7 and 9 are vertically aligned, peripherally spaced bolt holes 14 and 15 and extending through each such pair of vertically aligned holes is a hold down bolt 16. It should here be noted that since the upper edge 11 of the collar 6 protrudes above the level of the upper face of the flange 7, the edge 11 will be pressed into sealing engagement with the packing 13 when the bolts 16 are drawn tight, the packing 13 being forced into sealing engagement with the flange 9 by this same expedient.

Mounted on the annular bottom 2 of the casing 1 is a lower ball race 21 arranged to accommodate bearing balls 22 and supported on the balls 22 is an upper ball race 23 mounted on a pair of rings 24. Welded to and supported by the rings 24 is a dished filter pan 25 which although not shown is divided by a plurality of radially extending

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division stripes into a circular series of sector-shaped filtrate compartments 26. Formed integral with the pan 25 is a central annular filtrate port plate 27 provided with a ring of ports 28, there being one such port within the confines of each filtrate compartment 26. Sealed against the lower face of the plate 27 is an annular wear plate 29 provided with filtrate ports 31 in registration with the ports 28, said wear plate being bolted to the port plate 27. Seated on the lower face of wear plate 29 is a stationary valve body 32 provided with suction and blow back chambers 33 over which the filtrate ports 31 of the wear plate 29 rotate and thus establish communication successively between each of the filtrate compartments 26 of the filter pan and suitable sources of sub-atmospheric pressure and blow back pressure. For this purpose, the valve body 32 is provided with a cylindrical skirt 34 and with a conduit 35, communicating with each of the chambers 33 and arranged to be connected through a flange 36 with a flexible conduit 37. The details of construction of the filter pan and automatic filter above described are all in accordance with well known practice and in and of themselves involve known invention.

Welded to the cylindrical skirt 34 intermediate its ends and substantially at the level of the flange 4 is an annular flange 38 and bridging these two flanges and sealed thereto is a flexible watertight annular diaphragm 39. It will be seen that as a result of this construction, the diaphragm 39 forms a very simple and effective watertight seal between the filter casing 1 and the valve body 32 which, although referred to as being stationary in the sense that it has no rotary motion, nevertheless may wobble to some extent, for in accordance with standard construction, the valve body 32 must be biased against the wear plate so as to be substantially sealed thereto. Furthermore, the diaphragm 39 obviates the use of a running seal at this point.

The diaphragm 39 then, together with the packing 13, serves effectively to seal the entire filter within the filter casing and thus to avoid the egress of gases therefrom and the ingress of air thereinto.

Although not pertinent to the present invention and merely by way of explanation, it is to be noted that the structure illustrated in the drawing immediately above the filtrate compartments 26 of the annular filter pan 25 constitutes the radially extending stationary cylindrical casing of a conventional scroll discharger. Dischargers of this type include a rotating scroll disposed in the path of the cake formed and carried on the filter medium of the filter and arranged to cut the cake from the filter medium and to advance it radially outward and over the lip of the filter pan (25) into a discharge chute such as diagrammatically indicated on the left side of the present drawing. Although a scroll type of discharger has been indicated in the drawings, as above stated, it is not pertinent to the present invention and various other types of dischargers can be substituted therefor.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

A totally enclosed continuous rotary filter comprising: a filter pan; a sectionalized rotatable filter unit mounted within said pan for rotation therewith; a ported valve member fixed to said unit for rotation therewith; a stationary valve body arranged to register with said valve member, said valve member having a running watertight fit with said stationary valve body; a filter casing surrounding said filter and provided with an opening through which a portion of said valve body extends with substantial positive clearance; and a flexible watertight diaphragm completely bridging said clearance and being sealed to said valve body and casing.

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