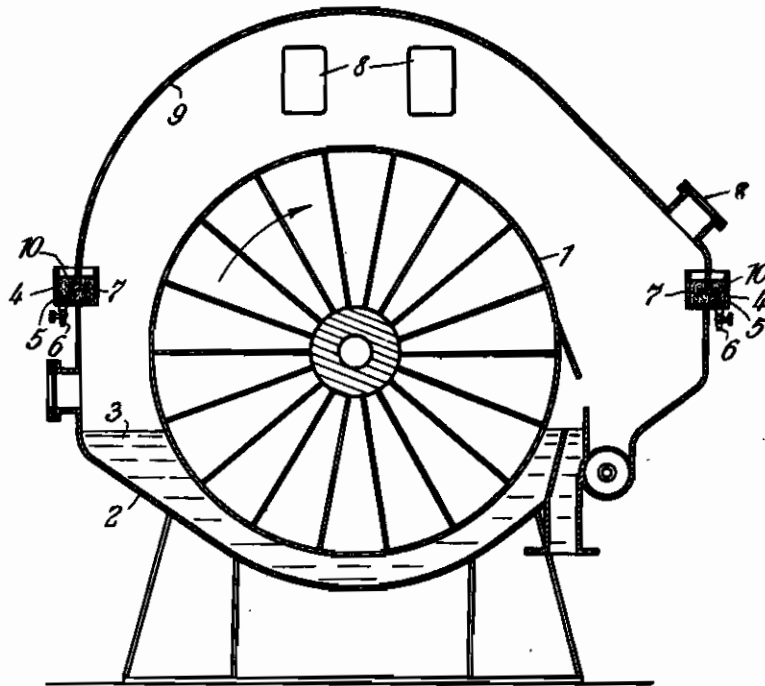


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GASTIGHT HOUSING FOR FILTERS
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ALIEN PROPERTY CUSTODIAN

GASTIGHT HOUSING FOR FILTERS

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The present invention relates to a gastight housing for filters serving the filtration of solutions containing volatile solvents. Such enclosed filters are especially used for newer dewaxing processes by which the wax for the production of oils with a low pour point is separated out at low temperatures by means of solvents or mixtures of solvents such as acetone, liquid sulphur dioxide, solvent mixtures containing sulphur dioxide, mixtures of benzol and acetone, by means of propane etc. In industrial plants the separation of the wax is effected by means of continuously running filters, especially by rotary drum cellular filters, rotary disc filters and other continuously working filters.

Since the solvents preferably employed are volatile substances, or contain such substances, and since the filtration is effected at temperatures far below room temperature, the filter is installed in a housing that prevents gases from escaping from and moisture from penetrating into the shell. The filter shell is covered with a layer of cork or other heat insulating material.

In order to get access to the interior parts of the filter, the filter shell has been so designed that it may be opened up. At rotary drum cellular filters and rotary disc filters the filter housing consists of the filter bowl receiving the substance to be filtered, and the cover mounted gastight on the bowl by flanges with inlaid gaskets, e. g. a rubber strip.

Other continuously running filters are designed correspondingly, the filter being enclosed by a two-part housing, the upper part of which is mounted gastight on the lower one.

Considering the sizes of the housing required, the manufacture of completely plain flanges is very difficult and expensive. It may be added that the packing material put between the flanges is destroyed each time the cover of the housing is lifted so that it becomes necessary to inlay new, accurately fitting rubber strips before the cover is put back into position which proves to be very troublesome. In many cases it has been tried to avoid taking off the filter cover by entering the filter through manholes in order to carry out minor repairs inside the filter.

The working inside the closed filter is only possible if the interior of the filter room is free of poisonous or oppressive gases. This, however, does not prove to be the case if acetone, benzol or sulphur dioxide has been used. Even if such a filter were rinsed with washing liquid and ventilated, the filter and parts of slack wax remained therein contain still enough solvent to make work

in the interior of the filter impossible without gas mask and protecting clothes.

The present invention proposes a device by which the filter housing is made gastight in a simple way and which allows taking off the cover and replacing it with much ease. According to the invention the rim of the lower part of the housing is provided with a groove in which the edged rim of the cover fits. The groove can be filled with a sealing medium.

The sealing of the filter is effected by filling the groove with the molten sealing medium and setting the cover into the liquid medium. The cover may also be set in first and the sealing medium subsequently applied. The latter must be easily fusible so that it can be filled in liquid form into the groove where it gradually solidifies after the cover is put in place.

If for any reason the opening of the filter becomes necessary the cover is simply raised. This can be facilitated by warming the solid or semi-solid sealing media. For this purpose a heating device e. g. a steam coil is provided in the groove.

This coil is also to be heated when the cover is to be set back. Since now and then it may become necessary to drain the sealing medium from the groove, the latter is further to be provided with suitable drain cocks.

In some cases it may be recommended to fasten the filter cover to the lower filter part additionally with a few bolts.

In case of minor, only a few mm of water column overpressures or vacuum, a liquid may be applied as sealing medium. If however, the latter is to be used at higher pressure differences that would necessitate correspondingly high liquid columns for tightening, solid sealing media are to be preferred. It was found, for instance, that—filling a 150 mm deep groove up to 100 mm with wax—the filter remained tight at an overpressure of a 2 m water column.

As sealing media plastic substances, such as asphalt, artificial resins, and so on, are applied which on solidifying must not develop cracks. For dewaxing processes paraffin wax has proved to be especially advantageous for several reasons. It is a medium containing similar ingredients as the substance fed to the filters so that the filter is not contaminated if the medium filled into the groove by some reason flows over. It may be added that it is very resistant and neither attacked from the substance fed to the filters nor the solvent applied, and that it dissolves only little or nothing of the above mentioned liquids. These facts are especially to be considered when

applying sulphur dioxide as dewaxing medium. Also to sulphur dioxide wax has no affinity. In case f. i. wax would have a dissolving effect on sulphur dioxide—if even to a small degree—the sulphur dioxide would gradually penetrate the entire sealing media and from there get into the atmosphere.

Therefore, it is recommended as specially advantageous to apply wax as sealing medium for the device under discussion for processes in which a substance containing sulphur dioxide is filtered.

For the above purpose mainly soft waxes or also oil containing higher melting wax species may be used.

When sealing media are applied which in some way do not quite meet their requirements, wax may be added forming then the upper absolutely gastight and inert layer.

Furthermore, easily fusible alloys, preferably Woods-metal, Roses-metal, Newtons-metal, soldering tin or the like have proved to be very suitable for the above purpose.

Metals of the above kind or metal alloys, respectively, have melting points which allow a liquefaction in the sealing groove by means of a suitable heating device. When applying the above metals and metal alloys it is possible to attain a strongly reliable tightness between the upper filter part and the filter bowl, which also resists considerable vacuum and over-pressures. Moreover, the above metals and metal alloys, respectively, are insoluble in the solvents or precipitants, respectively, used for dewaxing.

In order to secure an absolutely reliable adhesion of the metals or metal alloys used as sealing medium to the walls of the sealing groove and the jointing surface of the upper part of the filter, the respective surfaces are to be polished and cleaned from oil before the sealing medium is applied. This can be done in the usual well known way.

Specially good tightening effects are attained

in the following way: Coating the interior surface of the groove entirely or partly, preferably at the bottom, and the corresponding surface of the cover with a thin layer of a substance which homogeneously connects with the sealing medium. It can be recommended to use as suitable coating one or several components of the metal alloys which in the special case are to be applied as sealing medium. When tin-containing alloys are employed for filling the sealing groove, the walls of the sealing groove and the corresponding surface of the cover may be coated with a thin layer of tin before the sealing medium is applied. Furthermore, a coat of cadmium may be provided for the same purpose.

In order to make the tightening effect of the above sealing media still more effective it is recommended to extend the jointing surface to be dipped into the sealing medium by a special shaping. The surface to be dipped into the sealing medium may e. g. be hook- or T-shaped.

For certain purposes it may, furthermore, be desirable to provide additional safety against excessive stress. In such a case clamp-shaped holding devices may be used which hold the upper and lower part of the housing together.

The enclosed drawing shows the gastight seal as applied at a rotary drum cellular filter.

The filter drum 1 dips into bowl 2 on which the cover 9 provided with manholes 8 is mounted. The filter bowl is filled with the substance to be treated 3. The upper rim of the filter bowl is provided with groove 4 which is filled half with sealing medium 7. The gas cover 9 with its preferably T-shaped edge 10 dips into the sealing medium. The groove is provided with heating pipe 5 which may be heated by steam, and furthermore with cocks 6 by which the sealing medium may be drained, if necessary.

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