

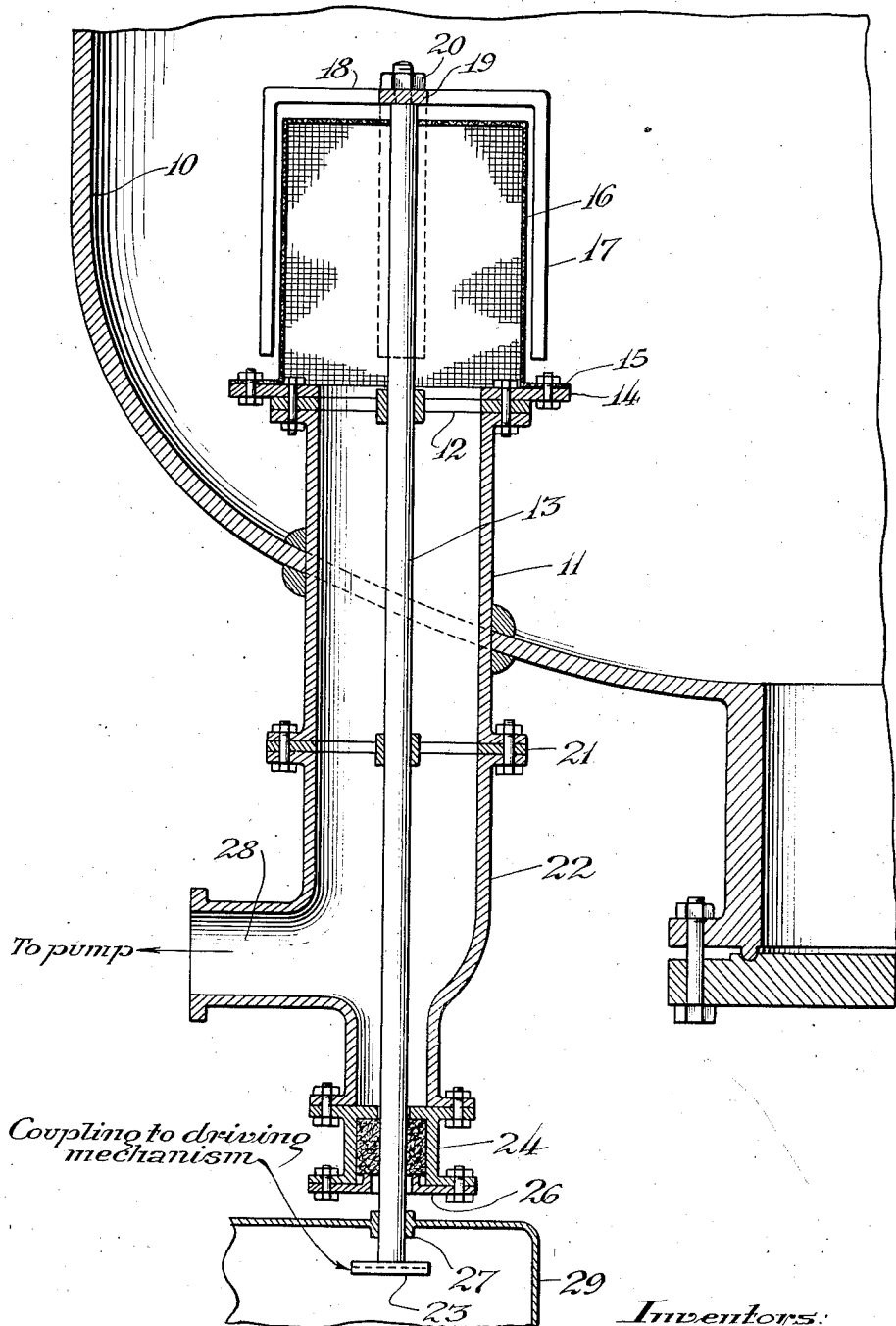
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STRAINER

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## UNITED STATES PATENT OFFICE

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## STRAINER

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3 Claims. (Cl. 210—151)

This invention relates to a non-clogging strainer such as required for certain uses in oil refineries. More particularly our invention relates to a non-clogging strainer for use preceding a pump.

When pumping from a vessel such as an evaporator tower or coking unit it is necessary to have a strainer between the vessel and the pump to prevent pieces of foreign matter entering the pump and thereby causing damage to the pump parts. However an ordinary strainer is often useless in that it becomes clogged with deposits of coke and tar at least some of which forms when the hot oil comes to rest on the strainer surface.

Therefore it is an object of this invention to provide a novel and efficient hot oil strainer. Likewise it is an object of our invention to prevent the medium being strained from being converted into tar, coke, etc., which otherwise would form and clog the strainer.

One object is to provide an apparatus which prevents the fouling of a strainer by coke, tar and the like. A further object of our invention is to provide apparatus for agitating the fluid adjacent the strainer surfaces thereby to prevent coke or tar formation in situ on the strainer. Another object is to provide an apparatus wherein all parts are readily accessible and removable for easy servicing during shut-downs. Still another object is to provide an apparatus requiring a minimum number of bearings, all of which are self-lubricated by the strained oil. Another object is to provide a non-clogging strainer which is independent of the operating conditions obtaining in the apparatus with which it is used. These and other objects will become apparent as the description of our invention proceeds.

One embodiment of our invention comprises an essentially cylindrical cage formed from perforated plate, wire mesh screen, or the like. Spaced from but nevertheless adjacent the surfaces of the strainer are mechanical agitator means adapted to revolve about the cage to keep the material being filtered from coming to rest at any point on the strainer surface and thus to prevent the formation of coke and the deposition of the characteristic and frequently gummy deposit which clogs the strainer. Suitable driving and control means are provided exterior of the vessel.

The invention will be more clearly understood from the following description taken with the accompanying drawing which forms a part of the specification.

In the embodiment illustrated, the vessel 10 is provided with spacer 11 extending through and welded to the base thereof. The upper or internal end of flanged spacer 11 supports spider bearing 12, one of two such bearing supports for drive shaft 13. Each of the spider bearings 12 and 21 is self-lubricated and cleaned by the strained oil. A strainer mounting ring 14, which in turn supports the strainer base ring 15 and strainer cage 16, is fixed to the upper flange of spacer 11. A plurality of longitudinal agitator arms 17 are carried by radial agitator and supporting members 18 which are integral with or otherwise fixed or attached to hub 19. The complete agitator assembly is rotatably fixed to drive shaft 13, for example by nut 20.

A second spider bearing 21 for shaft 13 is supported by the lower end of flanged spacer 11. A special T 22 likewise is bolted or otherwise fixed to the lower end of flanged spacer 11. The drive shaft 13 extends through the T 22, terminating in detachable coupling 23. A stuffing box 24 with or without gland oil connection and packing gland 26 are provided about the lower end of shaft 13. A bearing 27 can be fixed to motor and transmission mounting plate 29, said mounting plate preferably being fixed to the vessel, for example, by means of an attachment (not shown) to stuffing box 24. A suitable thrust bearing (not shown) is provided, preferably in a speed reducer assembly (likewise, not shown).

Hot oil being pumped from chamber 10 passes through strainer 16 thence through the outlet 28 of the conduit comprising spacer 11 and T 22. Revolving about the cage 16 are the agitator arms 17. The agitation of the hot oil at the surface of the cage prevents the oil from depositing coke or tar, formed in situ or carried by the oil to the strainer cage. By this means clogging of the strainer is avoided.

From the above description it will be apparent that we have devised a novel and efficient non-clogging strainer and attained the various objects of the invention.

One of the mechanical features of our strainer is that it is constructed as an integral unit which cannot be thrown into misalignment with itself by the effects of temperature and/or pressure on component parts of the apparatus with which it is used. Furthermore it permits a detail construction which not only allows the various parts to be removed from the assembly for repair or inspection with a minimum of inconvenience, but also permits all parts of the driving mechanism to be serviced while in operation.

Other features and advantages of the invention will be readily apparent to those skilled in the art. Although we have described one illustrative embodiment of our invention it will be understood that changes in the shape, details of construction, and proportion can be made without departing from the invention and we do not intend to be limited to this illustrative embodiment.

We claim:

1. In an apparatus for transferring hot oil having coke or tar depositing tendencies, the improvement comprising a pump-out conduit extending within a reservoir for said hot oil, a cylindrical strainer cage superimposed upon said pump-out conduit, a drive shaft extending longitudinally through said conduit and through said cylindrical strainer cage, means exterior of said conduit and of said reservoir for rotating said shaft, agitating means carried by said drive shaft adjacent to the strainer surface of said cylindrical strainer cage, said agitating means being adapted to be rotated by said shaft to maintain a continuously moving film of hot oil adjacent the strainer surface.

2. In combination a reservoir for hot oil having coke or tar depositing tendencies, a conduit extending substantially vertically through a wall

of said reservoir and adapted to withdraw hot oil downwardly therefrom, a cylindrical strainer cage interposed in the path of the normal flow of said hot oil entering said conduit, a drive shaft extending longitudinally through said conduit and through said cylindrical strainer cage, means exterior of said conduit and of said reservoir for rotating said shaft, supporting means carried radially by said shaft exterior of said cylindrical strainer cage, and agitating means depending from said supporting means, said agitating means being adapted to impart a swirling motion to the flowing hot oil adjacent the strainer surface whereby normal deposition of coke or tar on the strainer surface by the hot oil being transferred is minimized.

3. The method of transferring hot oil normally having coke or tar forming tendencies, the steps comprising agitating the hot oil adjacent a strainer zone, maintaining a continuously moving envelope of hot oil near the strainer surface whereby normal formation of coke or tar by the hot oil on the strainer surface is substantially reduced, continuously passing the hot oil through the strainer zone and continuously withdrawing strained hot oil from within said strainer zone.

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