Oct. 26, 1943. W. A. DICKSON 2,332,700

COOLING MEANS FOR CATHEADS

Filed Nov. 17, 1941 2 Sheets-Sheet 1

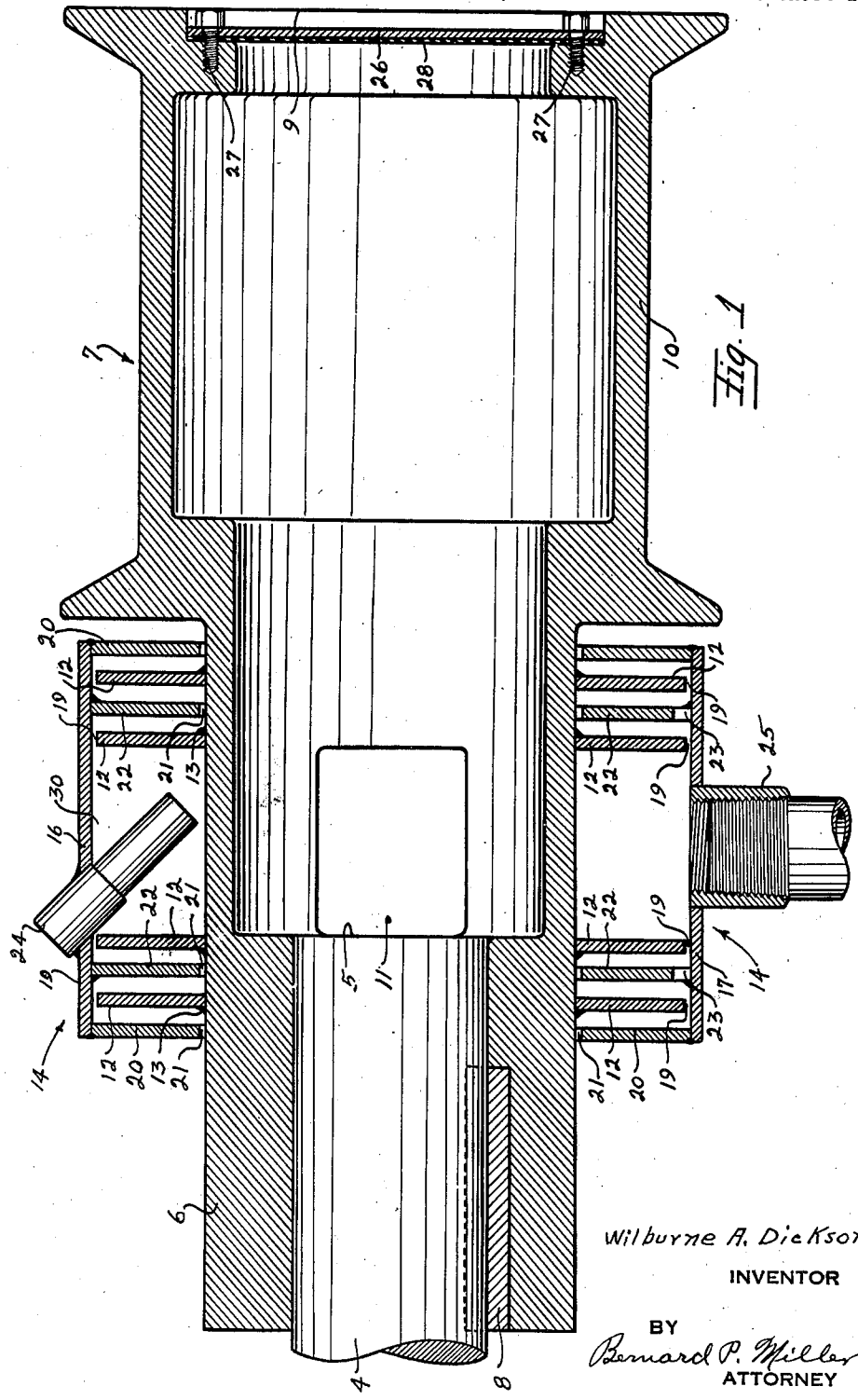


Fig. 1

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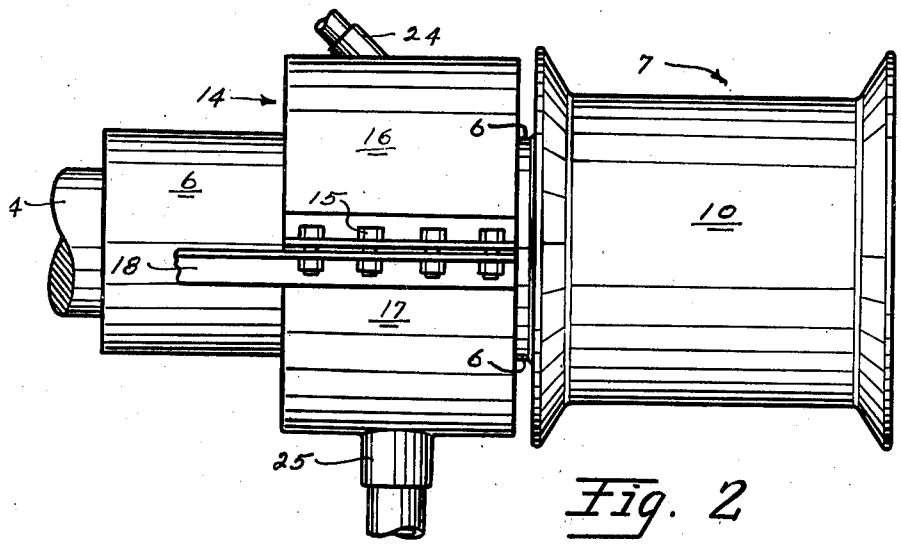


Fig. 2

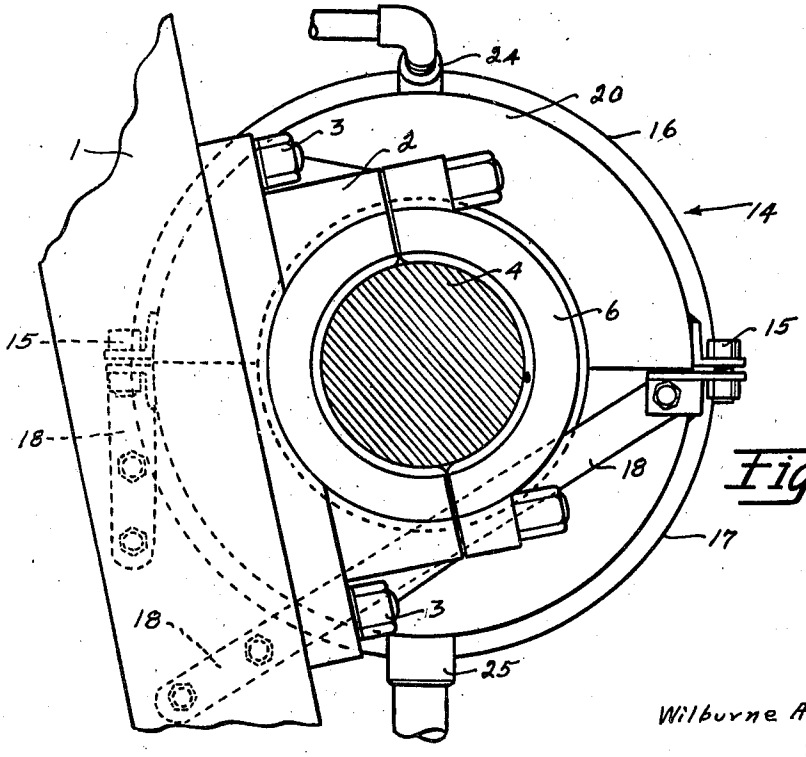


Fig. 3

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COOLING MEANS FOR CATHEADS

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7 Claims. (Cl. 242—117)

My invention relates to means for cooling, through the medium of a circulating liquid, catheads such as are in common use on oil field draw-works.

It is not primarily new in the art to circulate a liquid into and out of the draw-works catheads or winding spools in order to cool them, but so far as I have been able to ascertain, persons previously applying this principle have resorted to the use of various hydraulic packing between the cathead shaft and the cooling liquid chamber or reservoir.

The prime object of the present invention is the provision of a simplified cooling structure which does not require any means for packing between the liquid chamber and the cathead shaft, or the liquid chamber and the cathead sleeve, as the case may be.

A further object is the provision of a cooling structure which requires no anti-friction bearings between the shaft and the liquid chamber.

Another object is the provision of a device for the purposes described which is so designed that it may be installed upon practically any of the present day spinning line catheads without the catheads having been particularly constructed to accommodate the cooling system.

A still further object is the provision of a cooling system for the purposes described which has no moving parts to become worn or get out of order, the only wear being occasioned by movement of the circulating liquid.

Other objects will be apparent from the following description when taken in connection the the accompanying two-sheet drawings, wherein:

Figure 1 is a vertical sectional view of a usual type of spinning line cathead to which the present invention has been applied;

Figure 2 is a side elevational view of the same; and,

Figure 3 is an end view of the invention operatively mounted around a cathead shaft, which is shown in vertical section as being mounted upon a usual support of a draw-works.

Referring now more particularly to Figure 3 of the drawings, the reference numeral 1 indicates a portion of a usual draw-works jack-post, having a usual bearing mechanism 2 attached thereto by detents 3 and into which is journaled a usual cathead shaft 4. In Figure 1 the shaft 4 is depicted as terminating at the line 5, and to the end portion of the shaft is keyed a sleeve portion 6 of a usual spinning line cathead 7. The key which connects the shaft and sleeve is indicated by the reference numeral 8. It is usual practice to form most spinning line catheads, such as that indicated by the reference numeral 7, with the interior thereof hollow from the end 5 of the shaft outwardly to the extreme outermost end 9 of the drum portion 10 thereof. It is also common practice to provide through the wall of the sleeve portion 6 one or more openings, such as that indicated by the reference numeral 11, whereby air may circulate through the openings 11 and through the bore of the cathead. The mechanism thus far described is entirely usual to spinning line catheads, and is not a part of the present invention other than that the present invention is designed to be installed upon a cathead of such a type. By this is meant that the present cooling system is not primarily designed for installation upon automatic catheads, although there might be found instances where the system could be applied to an automatic cathead.

In carrying out the present invention I provide the exterior surface of the sleeve 6 with the plurality of two or more spaced outwardly extending annular vanes or fins 12. These vanes 12 are each originally formed in two semi-circular sections and are placed around the sleeve 6 and welded thereto as indicated by the reference numeral 13. The meeting ends of the vane sections are, of course, also welded together. Surrounding the outer edges of the vanes 12, but not touching such edges, is provided a cylindrical drum 14 which is made in two substantially semi-circular halves which are outwardly flanged at their meeting faces and which are bolted together by a series of bolts 15 (Fig. 2). The upper and lower sections of the housing 14 are indicated respectively by the reference numerals 16 and 17. As may best be seen in Figure 3, suitable brackets 18 are provided for mounting the lower body section 17 to the jack-post 1 so that it is held in rigid position with relation thereto. As stated above, the housing 14 clears the outermost peripheries of the vanes 12 and this clearance is indicated in Figure 1 by the reference numeral 19.

Both sections of the housing 14 are provided with annular ends 20 which lie outside of the outermost vanes 12, and the bores of which are sufficiently large to leave a clearance or space 21 between the ends 20 and the sleeve portion 6 of the cathead. Extending inwardly from the inner surface of the housing 14 are a plurality of

annular vanes or ribs 22 having their bores substantially the same diameter as the bores of the ends 20 of the housing, so that the inner surfaces of the vanes 22 do not touch the sleeve portion 6 of the cathead. The vanes 22 are provided adjacent the inner surface of the housing 14 with a series of annular spaced perforations 23, and these vanes 22 are so spaced from each other that they fall between the vanes 12 of the sleeve 6. Any suitable plurality of the vanes 12 and 22 may be provided so long as they are spaced apart from each other in a manner substantially similar to that shown in Figure 1.

Firmly welded into the upper body surface of the body section 16 is a pipe nipple 24 adapted to receive a hose, not shown, for injecting a cooling liquid such as water, into the space lying between the adjacent vanes 12 of the sleeve 6 and between the sleeve 6 and the housing 14. This space is indicated by reference numerals 30. It is preferable that the nipple 24 be disposed at an angle to which its inner end points toward the outer end of the cathead 7 and not directly toward the openings 11 in the sleeve. This nipple 24 acts as an inlet for the cooling fluid, and when the fluid is injected therethrough, the liquid passes through the windows as they rotate past the nipple. This liquid is projected at an angle at which it does not strike the opposite window 11, however. The bottom of the section 17 is provided with a pipe connection 25 which acts as an outlet for fluid as will be more fully described hereinbelow.

As best shown in Figure 1, the outer or free end of the cathead 7 is closed by a disc or plate 26 held in place by a plurality of suitable detents. A gasket 28 is employed to prevent leakage around the disc 26.

Operation

In operation, water or other suitable cooling liquid is projected through the nipple 24 and as the windows or openings 11 rotate beneath the stream, the liquid is projected through the windows toward the outer end of the cathead. The space 30 lying between the sleeve 6 and the housing and between the vanes 12, and into which the water is first projected, may fill up to some extent but it is not intended that it shall ever become entirely full, since the volume of the incoming liquid may be controlled by a suitable valve, not shown. In order for the liquid to escape from the housing 14 along the sleeve 6, it would first have to build up sufficiently to pass over the vanes 12 and through the clearance 19, thence back to the sleeve 6 and under the vanes 22, and so on. In other words, the vanes 12 and 22 act as a means for preventing escape of the liquid but at the same time relieve the necessity of there being any packing whatsoever between the housing 14 and the sleeve 6. There is therefore no necessity of having any anti-friction bearings, since there is no contact between any part of the housing and any part of the cathead mechanism. The space inside of the cathead will never become entirely filled with the liquid, however, due to its rotation. Its inner surface will be constantly covered with a film or layer of the liquid, and as the liquid gravitates to the bottom of the bore of the cathead, it will partially escape through the windows and thence outwardly from the housing through the outlet 25.

From the foregoing description, it may be seen that a cooling system has been provided for spinning line catheads, which system will accomplish all objects for which it is intended.

I claim:

1. In a device of the character described, the combination with a hollow spool having one end mounted upon a shaft for rotation therewith, and having its other end closed, said spool having a lateral through opening intermediate its ends leading from its exterior to its interior, of: a plurality of spaced annular outwardly projecting ribs rigidly carried by the spool at each end of said opening; a substantially cylindrical hollow housing surrounding said ribs and spaced slightly from the outer peripheries thereof; a plurality of inwardly projecting spaced annular vanes rigidly carried by the housing, said vanes staggered with relation to said ribs and extending adjacent to but not into contact with said spool; means for injecting a liquid into the top of the housing; and means for withdrawing said liquid from the bottom of the housing.

2. In a device of the character described, the combination with a hollow spool having a rope winding portion closed at one end, and having a connected sleeve portion at its other end, the sleeve portion having a lateral through opening leading from its exterior to its interior, said sleeve portion being mounted upon a shaft for rotation therewith, of: a tubular jacket surrounding the sleeve portion and enveloping said opening; a series of spaced outwardly extending annular ribs carried by the sleeve portion; a series of spaced inwardly extending annular vanes carried by the jacket; an upper inlet to the jacket; and a lower outlet from the same, said ribs and vanes alternating with relation to each other along the sleeve portion, and both series being free from contact with the member carrying the other series.

3. A device of the character described including: a hollow rope winding spool; a hollow sleeve portion connected to one end of the spool and mounted upon a shaft for rotation therewith; means for hermetically closing the other end of the spool; lateral passages through the sleeve portion leading from its exterior to its interior; a plurality of spaced annular outwardly projecting ribs rigidly carried by the sleeve at each end of the lateral passages; a substantially cylindrical hollow housing surrounding said ribs and spaced slightly from the outer peripheries thereof; a plurality of inwardly projecting spaced annular vanes rigidly carried by the housing, said vanes staggered with relation to said ribs and extending adjacent to but not into contact with said sleeve; means for injecting a liquid into the top of the housing; and means for withdrawing said liquid from the bottom of the housing.

4. A device as described in claim 1, in which the housing is constructed of two semi-circular body halves adapted to be fastened together around the spool; and means for fastening one body half to a support.

5. A device as described in claim 2, in which the jacket is constructed of two semi-circular body halves adapted to be fastened together around the sleeve portion; and means for fastening one body half to a support.

6. A device as described in claim 3, in which the housing is constructed of two semi-circular body halves adapted to be fastened together around the sleeve portion; and means for fastening one body half to a support.

7. A device of the character described includ-

ing: a hollow rope winding spool; a hollow sleeve portion connected to one end of the spool mounted upon a shaft for rotation therewith; means for hermetically closing the other end of the spool; lateral passages through the sleeve portion leading from its exterior to its interior; a water jacket surrounding but not in contact with the sleeve portion, said jacket enveloping said passages; means mounted on said sleeve and jacket for causing water in the jacket to travel a circuitous path at substantially right angles to the axis of the sleeve before it may escape along the sleeve from the jacket; a liquid inlet to the upper portion of the jacket; and a lower outlet from the same.

WILBURNE A. DICKSON.