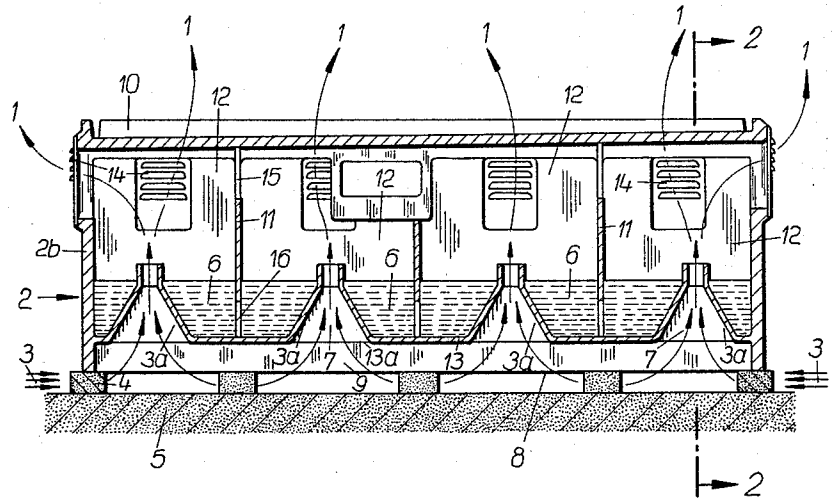
Sept. 27, 1966 E. LANG 3,275,495

MACHINE STAND AND COOLING MEANS THEREFOR

Filed Jan. 31, 1964

FIG. 1



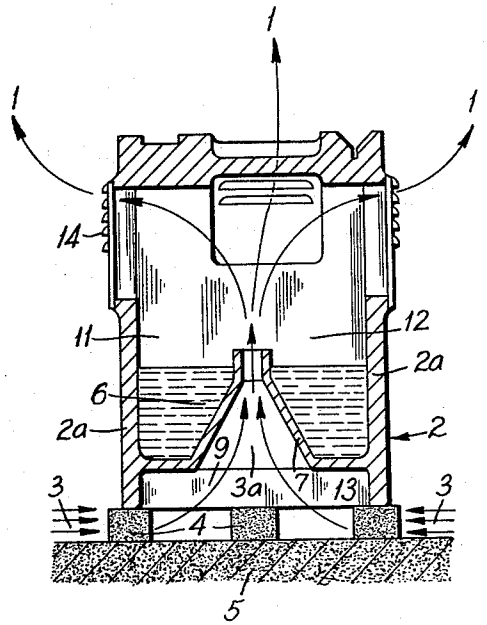


FIG. 2

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MACHINE STAND AND COOLING MEANS THEREFOR

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1 Claim. (Cl. 165—47)

This invention relates in general to stands or bases for large machines, and in particular to a new and useful stand for a liquid operated or controlled machine which forms a reservoir for the liquid and which includes one or more individual chamber portions having means for defining a cooling air flow upwardly from the bottom of the device and through an upper opening.

The invention is particularly applicable for use in connection with hydraulically controlled machine tools in which it is necessary to employ the stand for such machine tools as a reservoir for the hydraulic fluid, and also for means for cooling such fluid. All hydraulic drives develop some quantity of heat which is continuously transferred to the reservoir of such fluid during the operation of the machine. A steady rise in the hydraulic fluid temperature will result in the impairing of the working accuracy of the machine. Thus, it is very necessary that the hydraulic fluid will be cooled.

Prior to the present invention such devices as heat exchange apparatus, reflux condensers, tubular coolers and the like have been employed. In devices of this nature it is usual to circulate the fluid through the tubular elements and to circulate cooling air over the elements to cause a cooling action. In such devices it is necessary to provide a separate liquid circulator and device for blowing air through the cooler in order to provide adequate cooling.

In accordance with the present invention there is provided a novel stand construction for such machines which comprises a substantially block-shaped stand housing which is subdivided into a plurality of individual chambers and which is constructed so as to form a mounting base for a machine with which it is to be used. A feature of the construction is that the individual compartments are each provided with an insert at the bottom which extends upwardly from a bottom wall through a liquid reservoir for the hydraulic fluid. The upper end of each chamber is vented and the lower portion of the stand is mounted to permit the continuous intake of cool air and circulation upwardly through the insert for cooling the surrounding liquid in the reservoir and the chamber above the liquid continuously by natural convection. By utilizing the convection of the cooling air, a sufficient cooling can be achieved without providing any additional circulating means for the fluid or the cooling air.

Accordingly, it is an object of this invention to provide a mounting base or stand for a machine which forms a reservoir for hydraulic fluid and which includes means for circulating air by natural convection therethrough for the purpose of cooling the fluid.

A further object of the invention is to provide a mounting base or stand for a machine which operates or uses a control liquid which includes a substantially block-shaped stand forming a mounting base for the machine having wall means dividing the interior thereof into a plurality of individual chambers, each chamber being vented adjacent the top thereof and each forming a reservoir for the control liquid, and wherein means are provided for circulating air by natural convection upwardly through the bottom of each chamber in close association with the control liquid for cooling purposes.

A further object of the invention is to provide a mounting stand or base for a machine which is simple in design, rugged in construction and economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there are illustrated and described preferred embodiments of the invention.

In the drawings:

FIG. 1 is a longitudinal section through a machine stand constructed in accordance with the invention; and

FIG. 2 is a section taken along the line 2—2 of FIG. 1.

Referring to the drawings in particular, a machine stand **2** is of substantially rectangular or block-shaped configuration and includes side walls **2***a*, **2***a* and end walls **2***b*, **2***b*. A top wall **10** forms a machine bed for positioning a machine thereon.

In accordance with the invention the stand **2** is mounted on blocks **4** or other suitable means above the ground **5** to permit natural air flow in a cavity **9** formed below a bottom wall **13**. The bottom wall **13** is provided with a plurality of cutouts **13***a* which accommodate conical chimney elements or attachments **7** which are welded thereto. The interior of the stand **2** forms a reservoir for hydraulic fluid **6** which, for example, may be oil which is employed in the operation of the machine and which will gradually be heated during the continuous operation thereof.

In a preferred arrangement a plurality of chimney elements **7** is provided in order to increase the heat transfer area through which cooling convection air will be in heat exchanging relationship with the control fluid **6**. Additionally, a plurality of partitions **11** is advantageously installed to subdivide the interior space of the stand box into chambers **12** which vent at their upper ends through a plurality of louvres **14** having openings for the exit of the cooling air.

The liquid is advantageously stored in each of the chambers to a height slightly below the top of the chimneys **7**. Each partition wall **11** advantageously includes an opening **16** affording communication between the chambers at a location normally below the liquid level line. In addition, openings **15** are provided at the upper end of the partition walls to communicate some or all of the chambers with one another.

As indicated, the liquid **6** wets the walls of each of the chimneys which advantageously have a broad conical base portion **3***a*. The liquid **6** continually transfers heat to the chimneys **7**, as well as to the other walls of each chamber. Cooling air circulates by natural convection, as indicated by the arrows **3**, into the cavity **9** and is due to the thermic effect produced by the high temperature fluid **6**, rises in the directions indicated by the arrows and exits through one or more of the louvres **14**. In this manner a cooling air flow is constantly maintained to cool the liquid **6**. In this manner excessive heating of the hydraulic fluid during continuous operation of the machine is avoided. Due to the continuous elimination of heat, a moderate and constant operating temperature is maintained in the machine stand and it is not possible to have any distortion of the machine parts due to high temperature conditions.

While specific embodiments of the invention have been shown and described in detail to illustrate the application of the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

A stand for a machine and the like, comprising a substantially block-shaped member having a top wall forming

a mounting for a machine and a bottom wall spaced above the ground and exposed to the surrounding air, at least one partition dividing the interior of said stand into separate chambers, each chamber forming a reservoir for a control liquid and each being vented adjacent the upper portion thereof, and a chimney insert extending upwardly from the bottom of each of said chambers through the liquid and above the level thereof and defining a cooling air flow path from the bottom of said machine upwardly in heat exchange relationship with the liquid surrounding said chimney insert and out through said vent.

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