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METHOD FOR PRESSURE SEALING RADIATOR LEAKS

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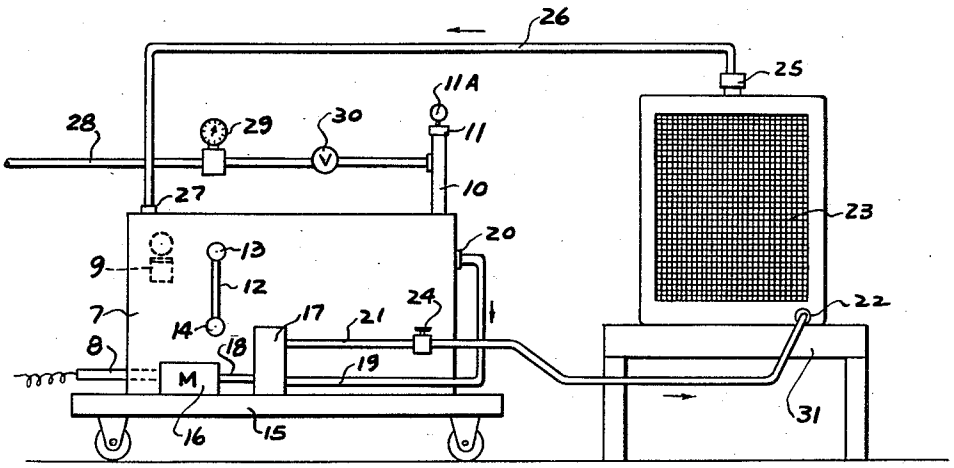



Fig. 1

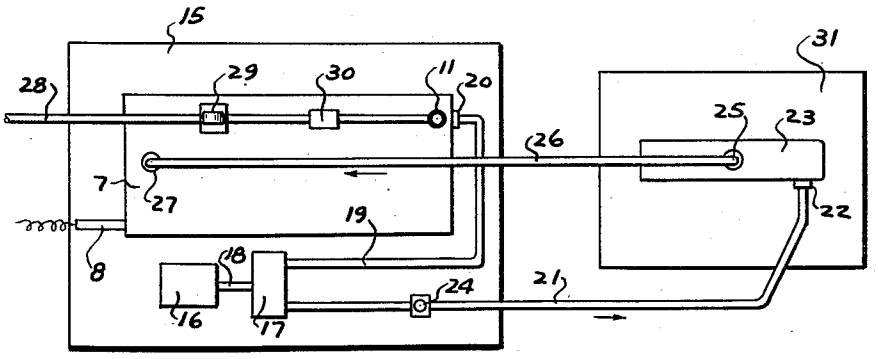



Fig. 2

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# METHOD FOR PRESSURE SEALING RADIATOR LEAKS

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This invention relates to vehicle radiators and has particular reference to a method and means for sealing, by impregnation, the leaks in radiators.

An object of the invention is to provide means for sealing radiator leaks by a method in which a sealing fluid is circulated through the interior of a radiator, while under a pressure and at a temperature which is substantially above the operating pressures and temperatures encountered in the radiator under normal conditions.

Another object of the invention is to provide a method of the character indicated, which will produce uniform and certain end results at all times, in as much as there is positive regulation and control over the material and working elements during the entire work cycle.

Another object of the invention is to provide a method and means for sealing radiator leaks, which will detect and remedy the most minute leaks, which are generally overlooked by conventional methods.

Another object of the invention is to provide a method of sealing radiators, which will insure against rupture or failure of the seal throughout a great range of operating temperatures, and will withstand the mechanical stresses developed during the moving and twisting of the radiator while in use, and the fatigue failure of the joints and the like.

The foregoing and other objects and advantages of the invention will become more apparent as the description proceeds, reference being made from time to time to the accompanying drawing forming part of the within disclosure, in which drawing:

Fig. 1 is a side elevational view of a device embodying the invention.

Fig. 2 is a top plan view of the device illustrated in Fig. 1.

Referring now more particularly to the drawing, it will be understood that in the embodiment herein disclosed, the reference character 7 indicates a water tank constructed of sufficiently heavy materials to withstand a considerably high internal pressure. The tank 7 is provided with a conventional heating element 8, which may be in the form of a "Chromolux" rod, or other suitable element, whereby the contents of the tank 7 may be heated. The reference character 9 indicates a thermometer for indicating the internal temperature of the tank 7. A filler spout 10, having an air-tight cap 11 is provided near one end of the tank, and the tank is provided with a fluid level indicator 12 and valves 13 and 14. The tank is preferably mounted on a suitable dollie 15, so that it may readily be moved from place to place. Also supported on the dollie 15 is an electric motor 16 which is arranged to drive water pump 17 through the shaft coupling 18. The intake side of the pump 17 is connected, by means of a water line 19, to the end of the tank, as at 20. The outlet side of the pump 17 is connected, by means of a water line 21, as at 22, to the lower end of the radiator 23. A shut off valve 24 is provided in the line 21. The upper end of the radiator



23 is connected, as at 25, to a return water line 26 which is connected, as at 27, to the interior of the tank to complete a water-tight and air-tight system. An air line 28 having a pressure gauge 29 and a relief valve 30 therein is connected to the filler pipe 10, so that air pressure may be exerted on the interior of the tank 7 and the lines communicating therewith. The radiator 23 is preferably supported in a suitable manner on a platform 31.

It will be understood that the radiator 23 is of a conventional type such as employed in the cooling system of an internal combustion engine, which has developed several leaks while in use possibly because of the weaving and twisting of the radiator, or because of fatigue failure of the joints or solder connections, or because of other reasons too numerous to mention, all of which are well known in the radiator art.

Heretofore, it has been the practice to seal the leaks by dumping into the cooling system of the internal combustion engine, a conventional sealing compound which sets up and hardens when brought into contact with the atmosphere. Such methods have left much to be desired, in that they depended entirely upon the circulatory means of the cooling system, which normally functions at a predetermined temperature and with very little pressure. The results obtained by methods now known to the public have been uncertain, unpredictable and unsatisfactory, in that many minute leaks, cracks, and loose joints existing in the radiators could not be detected, because there was not sufficient pressure in the system to bring them out.

It is, therefore, the primary object of the instant invention to provide a method and means for impregnating any leaks or openings in the radiator, however minute. This is accomplished by circulating through the radiator a suitable sealing and binding material, which will be forced through any openings at a temperature, and under a pressure, which is substantially in excess of the normal operating temperature and pressure of the radiator. I prefer to use any asbestos base sealer, which is replete with multitudinous asbestos fibers, which will function under a great variety of temperatures, and which will withstand the various mechanical stresses developed during the moving and twisting of the radiator when in use on a vehicle, and which will withstand the other fatigues developed in the radiator of a cooling system during normal operations. Such a sealer, when in the presence of water or other suitable solvents, and under the proper temperature and pressure factors as herein described, will form virtual flexible plugs in the leaks and radiator openings, which will withstand all of the vicissitudes enumerated herein.

The method is practiced as follows:

The radiator 23 is removed from the vehicle and supported on the stand 31 or in any other suitable manner, so that the fluid lines 21 and 26 may be connected thereto. Water or other suitable fluid is then placed in the tank 7, through the filler pipe 10, to a suitable level, which is indicated by the level indicator 12. The contents of the tank are then brought to the preferred temperature of from 180 to 210 degrees Fahrenheit, by means of the heating element 8. The liquid is then circulated through the radiator by means of the pump 17 until the temperatures throughout the system are equalized. The sealer is then introduced into the tank 7 through the filler 10 and the mixture of sealer and liquid is circulated through the system for a suitable length of time.

Air under positive gage pressure ranging from 5 to 15 pounds per square inch is then introduced into the tank 7 through the air line 28, which pressure is maintained while the circulation of liquid and sealer continues for approximately one-half hour. The circulation of liquid and sealer is then stopped and the system is held under

pressure until the radiator cools to a point where it can be easily handled. The pressure is then released manually through the valve 11A which is positioned on the filler cap 11, and the radiator is drained, after which it is found that all of the leaks and openings in the radiator have been impregnated by plug like formations of the sealer, which will in the future withstand all of the normal operating conditions of the engine cooling system in which the radiator is used.

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

1. The method of impregnating a radiator with a sealing material, which consists of circulating the sealing material through the radiator under a positive gage pressure above the normal operating pressure and at a temperature at or above the normal operating temperature, then stopping said circulation in said radiator, and allowing the sealing material to cool while under said pressure.



2. The method defined in claim 1, in which the sealer employed contains a fibrous substance which, upon cooling while under said positive gage pressure, forms flexible plugs in any undesirable openings in said radiator.

3. The method defined in claim 1, in which the sealer employed contains a fibrous material, which is circulated through the radiator under a temperature ranging from 180 to 210 degrees Fahrenheit, and under a positive gage pressure ranging from 5 to 15 pounds per square inch.

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