Jan. 10, 1956 J. KREMSER 2,730,083

HEAT EXCHANGER FOR VARYING THE LUBRICATING OIL TEMPERATURE IN INTERNAL-COMBUSTION ENGINES

Filed July 31, 1953 2 Sheets-Sheet 1

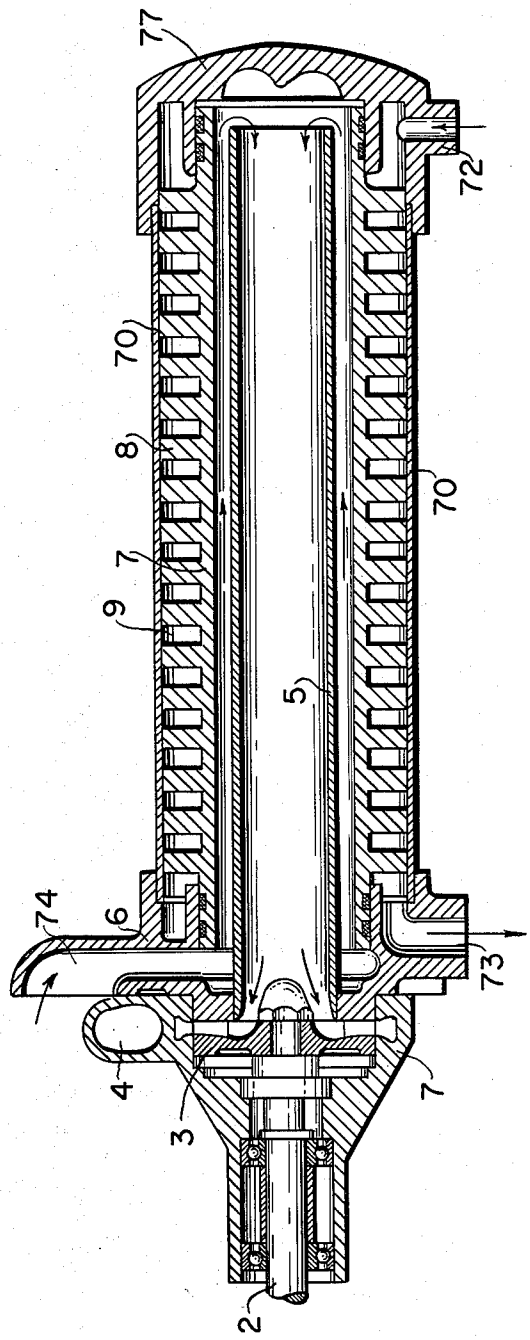


FIG. 1

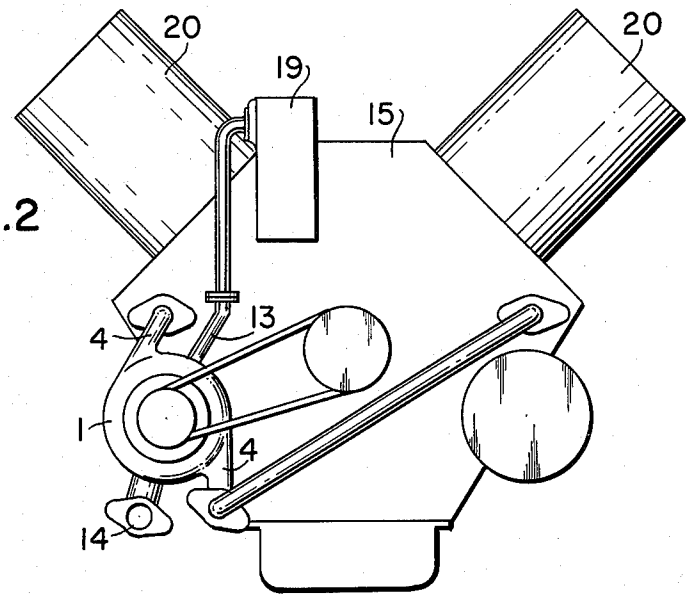
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FIG.2



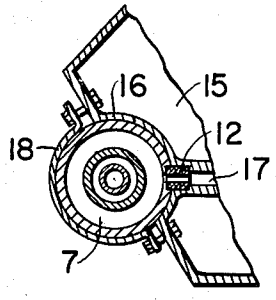


FIG.3

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HEAT EXCHANGER FOR VARYING THE LUBRICATING OIL TEMPERATURE IN INTERNAL-COMBUSTION ENGINES

Johann Kremser, Hannover, Germany

Application July 31, 1953, Serial No. 371,497

4 Claims. (Cl. 123—41.33)

The present invention relates to a device for varying the lubricating oil temperature in internal combustion engines, and particularly deals with a heat exchanger fitted in the lubricating oil and, respectively, cooling water circuit of internal combustion engines. It is already known to use oil coolers or heat exchangers of different design which were mounted on the engine block in a suitable way, in order to reduce the lubricating oil temperature.

It is one object of the present invention to provide a design which is a particularly suitable and simplified design of said device which may easily be fitted to any engine block.

It is another object of the present invention to provide a heat exchanger which is combined in one unit together with the cooling medium pump, both parts being connected with each other in a way so that the suction flow of the cooling medium passes through the heat exchanger.

It is still another object of the present invention to provide a heat exchanger which also serves as a carrier for the cooling medium pump, the complete unit with its longitudinal axis being arranged parallel to the engine axis on the engine block.

It is yet another object of the present invention to provide the engine block with a recess or the like which receives the unit formed by the pump and the heat exchanger, said unit being secured in place by a fastening strap. At the same time a connection may be provided in the recess of the engine block, said connection being in communication with the oil pressure line within the engine block and, on the other hand, being connected to the oil inlet of the heat exchanger. The heat exchanger may be of a length so that its oil outlet is outside of the contours of the engine block.

With these and other objects in view which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings in which:

Figure 1 is an axial section through a pump for the cooling medium and through the heat exchanger;

Fig. 2 is a front elevation of a V-engine with the pump and the heat exchanger; and

Fig. 3 is a cross-section through the heat exchanger.

Generally, the cooling medium pump comprises a housing 1, enclosing the impeller 3 journalled on the drive shaft 2. The cooling medium is passed through the cooling medium discharge pipe 4 and sucked-in in the middle of the housing. On the suction side of the pump the heat exchanger is arranged. It comprises a pipe 7 which is provided with ribs or helicoid elevations 8 on its circumference. Passages 9 for the lubricating oil are thus formed between said ribs. The pipe 7 with the ribs 8 is enclosed by a jacket 10. At one end the part described above is inserted into the housing part 6, which also carries the pump housing 1. Inside of part 7 there is a suction pipe 5 which transfers the cooling medium from the inlet 14 along the inner walls of the pipe 7 to the pump inlet. The cooling medium flows through the heat exchanger in the direction indicated by the arrows. At its free end the heat exchanger is provided with a cap 11 which in turn is provided with the inlet for the lubricating oil 12. The lubricating oil flows from the engine through the inlet 12 and through the entire length of the heat exchanger, and is discharged through the outlet 13 in the housing part 6.

The drawing clearly illustrates that the heat exchanger and the cooling medium pump form a self-contained unit of substantially cylindrical shape which may easily be fitted to the engine block 15, parallel to the longitudinal axis of the engine. For this purpose the engine block 15 has a recess 16 into which ends the lubricating line 17 so that it is connected with the oil inlet 12 when fitting the heat exchanger 7. A strap 18, a clamp, or the like secures the unit in its position. The length of said exchanger and, respectively, the fixing of said exchanger are laid out so that the lubricating outlet 13 is in front of the forward end of the engine block 15 where it may be connected to the lubricating oil filter 19.

Fig. 2 shows the application of the unit on a V-engine, the cylinders 20 of said engine being arranged in form of a V on the engine block 15.

While I have disclosed one embodiment of the present invention, this embodiment is given by example only and not in a limiting sense, the scope of the present invention being determined by the objects and the claims.

I claim:

1. In a heat exchanger unit for a cooling medium in internal combustion engines having an engine block, a housing, a pump mounted in said housing, a suction pipe disposed adjacent to and connected with said pump at the suction side of the latter, a jacket enclosing said suction pipe, an oil pipe disposed inside of the jacket, said oil pipe having a spiral rib disposed at the outer surface thereof, and said spiral rib engaging the inner face of the jacket, said spiral rib combined with the jacket defining a helical channel adapted to feed oil therethrough to be cooled, the inner face of said oil pipe being spaced apart from said suction pipe and the space between said suction pipe and said oil pipe defining a first passage for said cooling medium in a direction away from said pump and communicating with the free end of said suction pipe remote from said pump, and said suction pipe forming a second passage for said cooling medium in a direction towards said pump, inlet means for said cooling medium disposed adjacent said pump into said first passage, inlet means for said oil into said helical channel disposed at the end remote from said pump and outlet means for said oil from said helical channel adjacent said pump, in order to provide a counterstream between said cooling medium and said oil to be cooled.

2. The heat exchanger unit, as set forth in claim 1 which includes an additional housing disposed between said first mentioned housing and said jacket, said additional housing forming a carrier for said jacket and said first mentioned housing, and said inlet means for said oil being provided in said additional housing for feeding said oil into said first passage.

3. The heat exchanger unit, as set forth in claim 1, which includes an additional housing disposed between said first mentioned housing of said pump and said jacket, said additional housing forming a carrier for said jacket and said first mentioned housing, said inlet means for said oil being provided in said additional housing for feeding said oil into said first passage, and a drive shaft in said first mentioned housing, and the axis of said drive shaft being disposed coaxially with the longitudinal axis of said suction pipe.

4. The heat exchanger unit, as set forth in claim 1, which includes an additional housing disposed between said first mentioned housing of said pump and said jacket, said additional housing forming a carrier for said jacket

and said first mentioned housing, said inlet means for said oil being provided in said additional housing for feeding said oil into said first passage, a drive shaft in said first mentioned housing, the axis of the drive shaft being disposed coaxially with the longitudinal axis of said suction pipe, said pump with said suction pipe, said oil pipe and said jacket forming a substantially cylindrical body and said engine block having a recess complementary in its configuration to said cylindrical body, and the latter being removably received in said recess.

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