

RESTRICTED

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ENCLOSURE (B) 18

A SIMPLE FIELD METHOD
OF RECLAIMING
USED LUBRICATING OIL

by

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SUMMARY

Because of the difficulty of transporting used lubricants from the airfield to the refineries for re-refining, there was a need for a single method of reclaiming used lubricating oil utilizing apparatus which could be fabricated at the air fields from the materials on hand.

For this purpose, the author devised a method and apparatus, and made this apparatus available for practical use.

The method is as follows: Heat the used oil to 100°C temperature and stir into the heated oil, ashes of wood, grass, roots etc. (not charcoal) using about 15% of ashes by weight, and then heat to 130°C and filter with a thin filter-paper or newspaper.

This reclaimed oil can be used in every type of engine, such as the Homare, Kasei and Atsuta.

I. INTRODUCTIONA. History of Project

At first the author tried to discover a suitable mixing agent such as aluminum silicate. (aluminum silicate is not available everywhere), and then tested every minute powder, such as aluminum, silica, magnesia, CaO, active carbon, etc.

At last the author discovered that the ashes of many things such as wood, and coal, and CaO, and MgO were very effective for this purpose.

B. Key Research Personnel Working on Project

Chem. Eng. Lieut. T. FUJIMOTO

II. DETAILED DESCRIPTIONA. Description of Apparatus

This apparatus is made very easily. The materials of fabrication were available at every airfield.

This equipment is constructed in two parts, one is the filtering part and another is the vacuum part, the filtering part is in the form of an oil bath, which contains an filtering plate with drilled hole, 5mm in diameter. The bottom of this oil bath and the water-separator are connected by pipe, including a valve and pipe union.

The vacuum part is made of a gasoline drum, and airplane boost meter, which shows the degree of vacuum, and wing hand pump which make a vacuum and draws out the reclaimed oil. The filter paper sticks to the filter net on plate, which is supported on the funnel.

wood fire is used to heat the oil bath, because an airfield has no gas or electricity.

The general view is shown in Figure 1(B)18.

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B. Experimental Results

1. Yield: 70%-85%
2. Physical and chemical properties of products are shown in Table I(B)18.

The used oil was acquired from Yokosuka Airfield. This oil had had 30 hours service in the engine of "Shiden", the name of an airplane.

3. Operating or test difficulties

- a. Filter plate and filter paper: Filter paper must first be affixed on the filter net by oil-wetting the paper with new lubricant and then sticking it tightly on the net. Then, the vacuum pump (wing pump) acts from bottom of a vacuum chamber to suck the filter paper against the filter plate.
- b. Heating: If the water in the used oil exceeds 0.1%, it must be heated slowly and stirred to prevent foaming.
- c. Ash (mixing agent): Ash must be burned thoroughly. Before using, the ash must be dried thoroughly.
- d. Vacuum system: Japanese oil drums will collapse if the vacuum exceeds 1/2 atmosphere, so a vacuum gauge (boost meter) must be utilized.

4. Advantage of this method and apparatus

- a. It does not use special or high price materials.
- b. It uses only firewood as fuel, which can be obtained everywhere.
- c. The operating procedure is very simple, so anyone can use it.
- d. This apparatus is light in weight, and can be transported easily.

III. CONCLUSIONS**1. Materials of this apparatus:**

Drum	3
Wing Pump	1
Cook	3
Boost Meter	1
Thermometer	1
Glass tube	1

2. Yield of reclaimed oil: 70%-85% of used oil.

3. Capacity: Reclaimed oil can be produced at the rate of 7 to 20 liters per hour by this apparatus.

4. The reclaimed oil obtained by this method and apparatus, can be used practically at all of the naval airfields.

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Table I(B)18
PHYSICAL AND CHEMICAL PROPERTIES OF PRODUCTS

		Used Oil	Reclaimed Oil
Viscosity	100°F	1714.1	1552.4
	210°F	123.7	119.4
Viscosity Index		99.5	102.4
Ash		0.204	0.012
Acid Value		0.257	0.084

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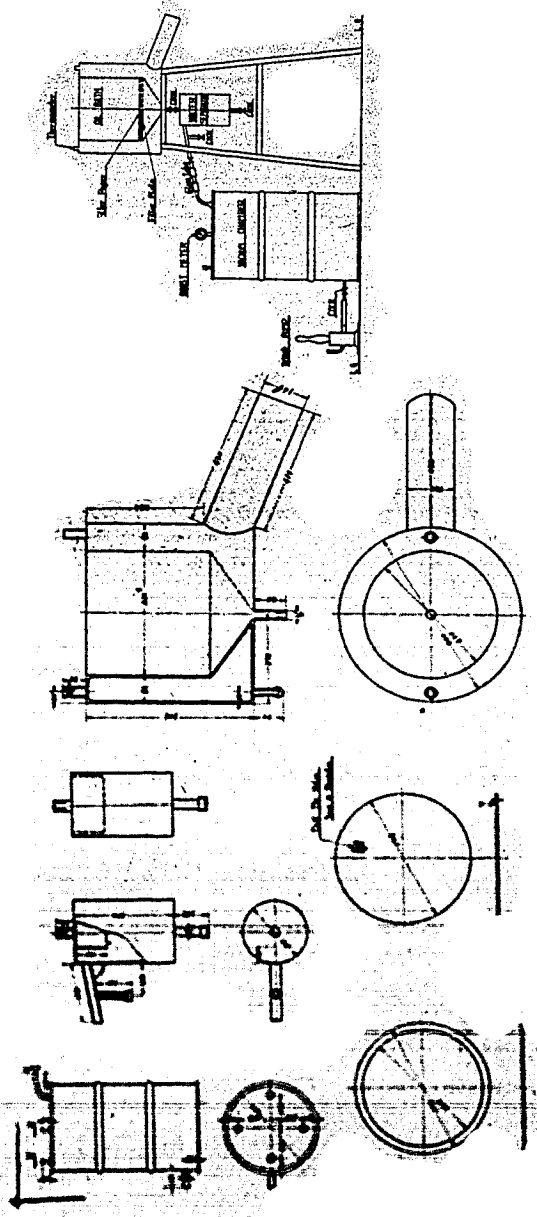


Figure 1(B)38
A SIMPLE FIELD APPARATUS OF RECLAIMING USED LUBRICATING OIL