Dec. 26, 1961 R. F. O'HARA 3,014,389

RADIATOR CAP REMOVER WITH DEFLECTOR

Filed Jan. 27, 1959

FIG. 1

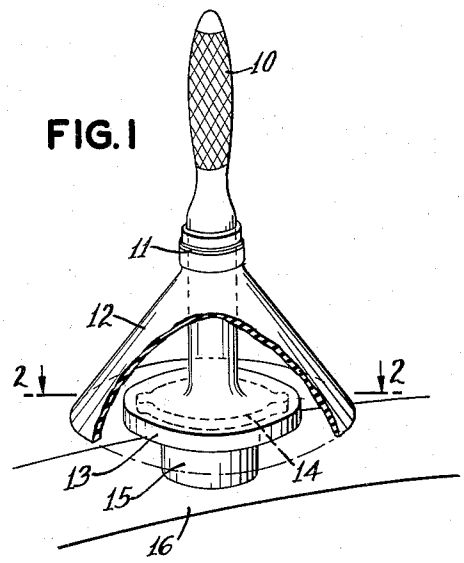


FIG. 3

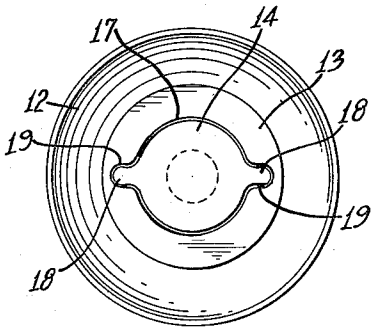


FIG. 2

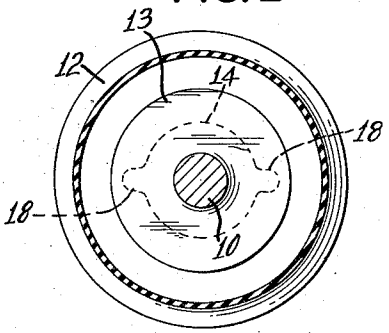


FIG. 4

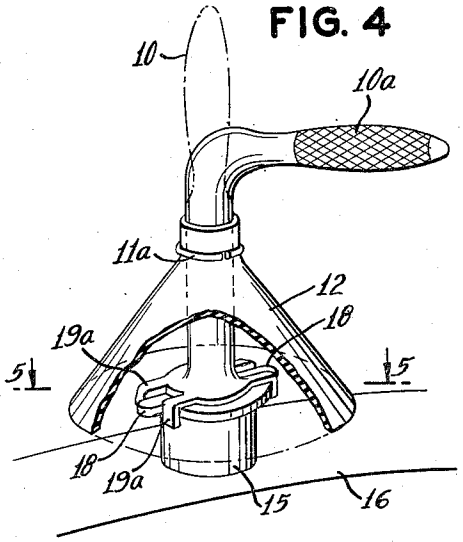
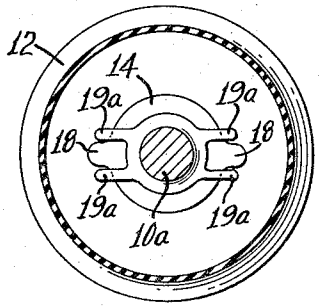


FIG. 5



INVENTOR.
RAYMOND F. O'HARA

BY

John C. Linihan

ATTORNEY

United States Patent Office 3,014,389 Patented Dec. 26, 1961

3,014,389

RADIATOR CAP REMOVER WITH DEFLECTOR

Raymond F. O'Hara, 276 E. 161st St., Bronx, N.Y.

Filed Jan. 27, 1959, Ser. No. 789,438
2 Claims. (Cl. 81—90)

The present invention relates to a safety device for removing closure caps from radiator cooling systems.

In recent years, the water cooling systems of gasoline engines have been operated at pressures slightly above atmospheric in order to increase the efficiency of the system. This slight elevation in pressure is achieved by the use of a gasket closure device which seals the radiator unit. However, operation at an elevated pressure permits, under certain circumstances, the temperature of the water coolant to rise above its atmospheric boiling point. Since the operation of the cooling system depends on heat exchange with a forced draft of air, interruption of the flow of air will permit the temperature to increase. It is customary to periodically check the water level in the radiator by removing the closure cap. Usually, and particularly in the case of automobiles, this is done after the engine has been running and, therefore, after the cooling medium has reached an elevated temperature. If the temperature in the cooling system exceeds the atmospheric boiling point, removal of the cap releases the pressure and the water immediately boils with the evolution of steam and the discharge of fairly large quantities of water from the radiator. This, of course, is an unsafe condition which has caused many serious injuries.

It is an object of this invention to provide a device for safely removing closure caps from radiators.

It is another object of this invention to provide a safety wrench.

Various other objects and advantages of the present invention will become apparent on reading the accompanying description and disclosure.

In the drawing,

FIGURE 1, is a view partly in cross section of a safety wrench constructed in accordance with the present invention.

FIGURE 2, is a view taken on line 2—2 of FIGURE 1.

FIGURE 3, is a bottom view of the wrench of FIGURE 1 positioned on a closure cap.

FIGURE 4, is a view partly in cross-section of another form of the present invention.

FIGURE 5, is a view taken along line 5—5 of FIGURE 4.

Referring to FIGURE 1 of the drawing, a safety wrench constructed in accordance with the present invention includes a handle **10** having radiator cap engaging means **13** at one end thereof and a hollow jacket **12** having an inner deflecting means secured to said handle by securing means **11** and positioned around said cap engaging means.

The handle may be made of any suitable rigid material, such as wood, rigid plastic, e.g., polystyrene, hard rubber, or metal. Usually, a material which does not conduct heat is preferred although metal may be employed if it is provided with insulation.

The enclosure engaging means may likewise be made of any suitable rigid material, such as metal, plastic or wood and may be a separate element which is joined to the handle by cementing, nailing, etc., or may be formed as an integral part of the handle. Thus, in a preferred construction the handle and wrench are molded as one unit using high impact polystyrene.

The deflecting means, may also be made from a variety of materials although preferably a resilient material, such as rubber or polyvinylchloride, is preferred. A resilient material is preferred because it can be pressed down firmly against the radiator in the event that water or steam is being discharged therefrom, and will therefore more

effectively deflect the erupting water or steam. As shown in FIGURE 1 of the drawing, the deflecting means is conically shaped and this shape is preferred because it is more readily fabricated. However, any geometric arrangement of the deflecting means may be employed so long as it defines an area around the engaging means. Thus, cup shape and bell shape deflectors may also be employed. The hollow deflector is held in place by any suitable method such as by adhesives, tape, split rings or the like.

Referring again to FIGURE 1 of the drawing, the safety device is shown in position with cap engaging means **13** engaging radiator cap **14** which is positioned on the neck **15** of radiator top **16**. In this illustration, the cap is removed by turning handle **10** and, in the event that the water coolant in radiator **16** is above its atmospheric boiling point and erupts, the water is deflected by the inner surface of conical deflecting means **12**.

FIGURE 2, a view taken along line 2—2 of FIGURE 1, and FIGURE 3, a bottom view of FIGURE 1, shows the handle **10**, the hollow jacket deflection means **12**, the radiator cap engaging means **13** and the radiator cap **14** having diametrically opposed flanges **18**. In recent years, the radiator caps for automobiles have been standardized and in their present form the external part of the cap includes a circular disc having two diametrically opposed flanges. Accordingly, the cap engaging means of the present invention is designed to engage these flanges. The cap engaging means shown in FIGURES 1–3 is of the socket wrench type and is molded to conform to the shape of the radiator cap. Thus, as shown in FIGURE 3, the socket wrench includes a circular surface **17** and diametrically opposed slots **19** which engage flanges **18**. The construction shown in FIGURES 1–3 is of particular value where the socket wrench is made by molding a suitable plastic material such as polystyrene. In this instance, the socket wrench and handle may be molded as a unit.

Referring to FIGURE 4 and FIGURE 5, which is a view along lines 5—5 of FIGURE 4, another form of the safety device embodying the present invention is presented. Corresponding parts in FIGURES 4 and 5 have the same numbers as FIGURES 1–3. The device shown in FIGURES 4 and 5 includes a handle **10** which can take a variety of forms; the preferred form is that of handle **10** since its length, as compared to other possible forms such as handle **10*a***, increases the distance between the radiator cap and the hand of the user thereby providing an additional safety factor. The hollow deflector **12** is held in place by a split-ring **11*a***. The cap engaging means, in this instance, is a flat disc having diametrically opposed pairs of flanges **19*a*** which provide a slot for engaging radiator cap flanges **18**. It is obvious that other designs of the engaging means can be devised and also other wrenches may be substituted for the wrenches illustrated where non-standardized radiator enclosures are employed. Thus, if a hexagonal radiator cover is used a wrench designed to accept a hexagonal shape can be employed.

The efficiency of the device was tested in an automobile cooling system. For this test, the automobile engine was operated while restricting the flow of air through the radiator by blocking off the cooling elements. When the temperature gauge indicated that a high temperature had been reached, the radiator cap was removed using the device of this invention. On removing the cap, considerable quantities of water and steam were discharged from the radiator but these were deflected away from the person holding the safety device which was held in position over the radiator opening until the discharge of water and steam had substantially subsided. For this test, the safety device included a wooden handle approximately 10 inches

in length and 1 inch in diameter. A metal cylinder cut out to provide opposed slots was secured to one end of the handle with screws. A cone shaped rubber deflector was positioned at about the middle of the handle and secured thereto with electricians tape.

Various modifications and alterations of the apparatus of this invention will be apparent to those skilled in the art and may be used without departing from the scope of the invention.

I claim:

1. A device for removing radiator caps which comprises: a socket wrench adapted to engage a radiator cap, a hollow cone shaped resilient jacket having an inner deflecting surface disposed around said socket wrench and a handle connected to said socket wrench and extending through the apex of said cone shaped jacket to provide an external grasping means, said cone shaped jacket being secured to said handle and the open end of said cone shaped jacket extending beyond said socket wrench.

2. A device for removing radiator caps which comprises: a flat disc provided with diametrically positioned

pairs of flanges, said pairs of flanges providing opposed slots adapted to engage the flanges of a radiator cap, a hollow cone shaped jacket having an inner deflecting surface disposed around said flange disc, a handle external of said hollow jacket and connected to said flanged disc, said hollow jacket being secured to said handle and the open end of said jacket extending beyond said flat disc.

References Cited in the file of this patent

UNITED STATES PATENTS

302,331	Griswold	July 22, 1884
1,808,462	Hareth	June 2, 1931
1,894,487	Gunther	Jan. 17, 1937
2,080,090	Mumaugh	May 11, 1937
2,464,941	Rader	Mar. 22, 1949
2,599,668	Taylor	June 10, 1952
2,895,363	Cox	July 21, 1959

FOREIGN PATENTS

113,540	Great Britain	Feb. 28, 1918