May 31, 1966 W. F. GROTE 3,253,485

RADIATOR CAP REMOVER

Original Filed July 5, 1963

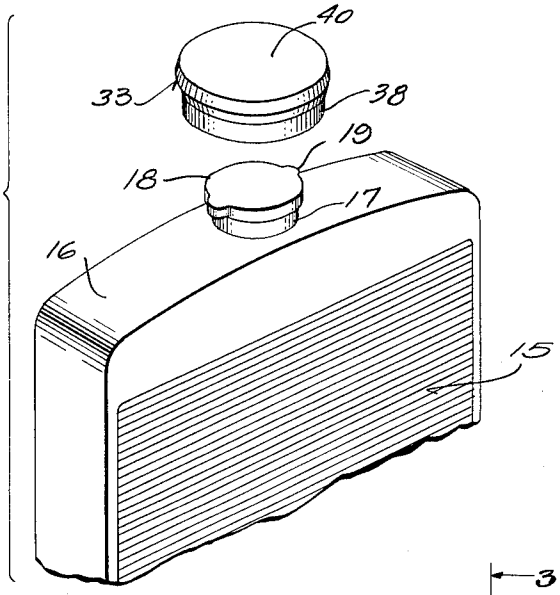


Fig. 1

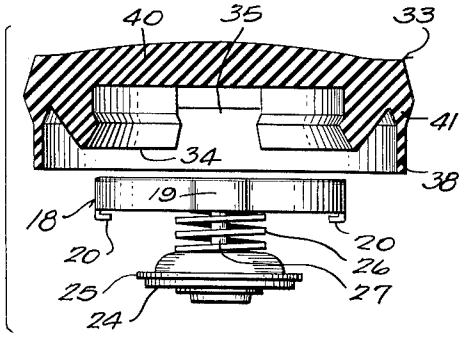


Fig. 3

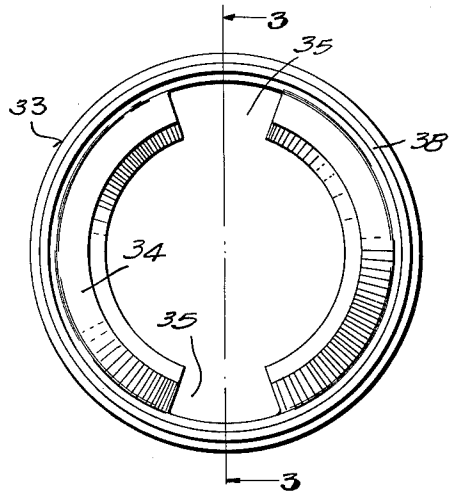


Fig. 2

INVENTOR
WALTER F. GROTE
Miles Kenningett
ATTORNEY

United States Patent Office 3,253,485 Patented May 31, 1966

3,253,485

RADIATOR CAP REMOVER

Walter F. Grote, Madison, Ind., assignor to Grote Manufacturing Company, Madison, Ind., a corporation of Kentucky

Original application July 5, 1963, Ser. No. 292,924, now Patent No. 3,186,263, dated June 1, 1965. Divided and this application Mar. 9, 1965, Ser. No. 438,218

2 Claims. (Cl. 81—3.1)

This is a division of S.N. 292,924 filed July 5, 1963, now Patent No. 3,186,263.

This invention relates to improvements in a tool for safely releasing, removing and replacing the cap of an automobile radiator.

Whenever a liquid cooled internal combustion engine operates under conditions leading to heating of the cooling liquid, it is possible for the liquid to reach its vaporizing temperature or even to be heated above the boiling point. In some cases the vapor builds up pressure sufficiently to eject a substantial quantity of liquid from the radiator if the radiator cap is removed before the pressure is vented. Even if the radiator cap is only loosened so that vapor may escape relatively slowly from the radiator, the vapor itself may well be above the boiling point of the liquid. In either case, the person releasing or removing the cap is in danger of being scalded or of being otherwise hurt in attempting to avoid ejected hot liquid or a cloud of vapor.

The present invention provides a simple tool for releasing and removing an automobile radiator cap with greatly reduced danger of the user being scalded by boiling liquid escaping from the radiator or by hot vapor therefrom. Essentially the tool provides a resilient member forming a socket with pockets laterally therefrom for receiving an automotive radiator cap having ears extending therefrom, the resilient member providing an inner flange for gripping the cap and providing an outer skirt which can bear on the radiator around the cap for controlling the escape of hot vapor or liquid when the cap is released but not yet removed. The skirt is flexible but of sufficient thickness to resist the action of considerable fluid pressure and is long enough to seal against the radiator shell when the member is seated on a radiator cap in place on the radiator. The skirt is capable of compression and folding to allow venting of vapor on the side away from the user, without danger that vapor may escape on the compressed side of the skirt adjacent the user of the tool.

In the drawings:

FIG. 1 is a perspective view of a fragment of an automotive type radiator with a cap to be removed, with the present tool shown as approaching the cap for engagement thereof.

FIG. 2 is a bottom plan view of a one-piece, entirely resilient tool, and

FIG. 3 is a cross section of the structure shown in FIG. 2 and taken on the line 3—3 of FIG. 2.

Referring to the drawings by reference numerals, **15** generally designates an automobile radiator with a shell **16** in which is formed a filler neck **17** to be closed by a cap having a generally cylindrical portion **18** with two ears **19**, extending diametrically therefrom. A common construction of the radiator cap **18, 19** is shown in FIG. 2 as having two diametric inwardly extending ears **20** to engage under an interrrupted outwardly extending flange of the radiator neck as is well known. A sealing member **24** is backed by a body **25** attached to the cap part **18** by a spring **26** and a pin **27** extends from the cap part **18** to limit compression of the spring **26**.

The cap top part **18, 19** seats in the socket and in the pockets of the tool to be now described, and the cap is held in its seated position in the tool by the resilience of a portion of the tool.

Referring now to the present tool, a resilient member generally is designated **33** and has a relatively heavy top portion from which extends a flange **34** to form a socket receiving the cap **18** and the flange is interrupted at two diametrically opposite points to provide pockets **35**. The flange **34** extends downwardly and inwardly from the top of member **33** and defines an opening requiring slight expansion when the radiator cap passes through the opening. A flexible and compressible skirt **38** extends from the periphery of the socket member top portion **33** to a substantial distance below the flange **34**, such skirt pressing around its entire periphery on the radiator shell when the tool is seated on the cap. The top portion **40** is made much heavier than flanges **34** and is arched and is substantially more rigid than other portions of the tool. The skirt **38** is thickened upwardly from **41** and tapers to the thin wall part **38** which may be radially compressed and folded against the radiator shell.

It is preferred that the tool be made of a material of a durometer of approximately sixty to assure adequate transmission of rotary pressure on the cap ears.

The present tool is used for safely removing a cap from an automotive radiator containing hot liquid which is forming hot vapor, or which may eject hot liquid and/or vapor when the cap is removed (and if the vapor pressure has not been previously vented to atmosphere). The tool is placed so that the cap ears enter the tool pockets and sufficient pressure is put on the tool to expand the tool flange and allow the top portion of the cap to slip inside the flange and seat against the end of the socket of the resilient member. The cap ears are then between the flange ends so that the cap may be rotated to release it from the neck of the radiator. After the cap is released from the radiator neck, the tool is tilted toward the user so that the skirt is pressed on the radiator shell on the side of the neck toward the user, but is lifted slightly away from the radiator shell on the side of the neck away from the user. Thus any vapor under pressure in the radiator is vented and discharged safely away from the user. The resilient socket member is preferably made from an elastometer not affected at the temperature of boiling of the common liquids used for automotive cooling, so that the radiator cap may be safely left in the tool and be returned thereby to the radiator neck so that the user need never touch the hot metal.

I claim:

1. A tool for safely removing from a radiator shell or the like an automotive radiator cap having diametrically opposed ears and requiring to be rotated for its disconnection from the shell, said tool comprising a generally circular top portion constituting a handle and provided with a flexible annular marginal skirt, and a pair of materially less flexible segmental flanges extending downwardly from the handle within the skirt and having spaced ends adapted to receive the ears of the cap, each of the segments being provided with an inner face provided with an inwardly projecting arcuate lip axially spaced from said top portion by substantially the thickness of the cap to be removed, the said lips being tapered in cross section both upwardly and downwardly and the segments being sufficiently flexible to permit the lips to be forced over the radiator cap when the ears of the cap are received between the ends of

said segments, the skirt being of greater axial length than the segments for engagement with a radiator shell for confining hot fluids when the cap is released from the shell.

2. A tool acording to claim **1** in which the top portion, the skirt and the segments are integral, the skirt being thin in cross section and the segments being materially thicker near their top portions and connected near the top portion with the skirt and having outer surfaces connected with the skirt at a level above the respective lips and thence extending radially downwardly and inwardly and terminating in arcuate apices.

References Cited by the Examiner

UNITED STATES PATENTS

2,701,491	2/1955	Ross	81—125
2,895,363	7/1959	Cox	81—125
2,985,208	5/1961	Hibbard et al.	81—125 X
3,014,389	12/1961	O'Hara	81—90
3,048,067	8/1962	Miles et al.	81—90 X
3,086,805	4/1963	Dardaine et al.	81—3.4 X

WILLIAM FELDMAN, *Primary Examiner.*

MILTON S. MEHR, *Assistant Examiner.*