

[54] ANTI-NOISE ROCKER ARM COVER

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[22] Filed: Oct. 2, 1972

[21] Appl. No.: 294,254

[52] U.S. Cl. 181/33 K, 123/90.38, 123/198 E

[51] Int. Cl. E04b 1/99, G10k 11/04

[58] Field of Search 181/33 K; 123/198 E, 90.38

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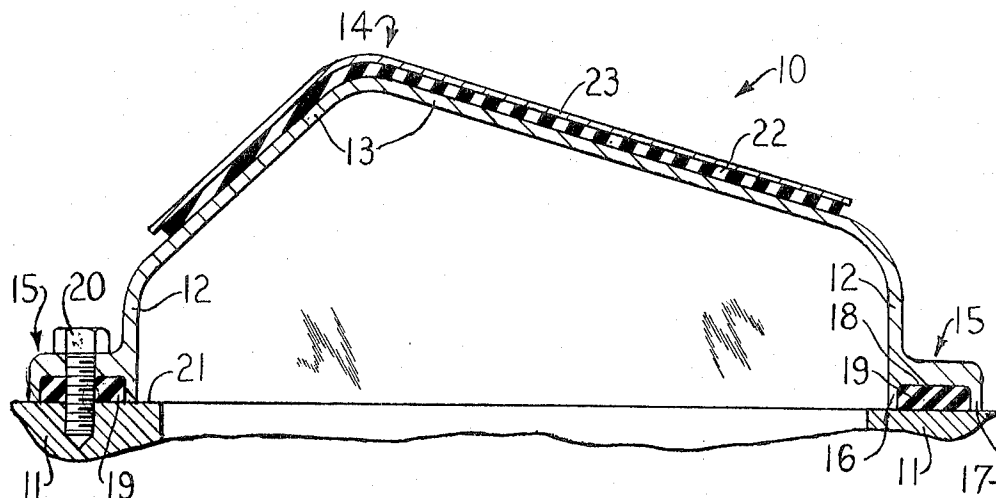
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ABSTRACT

A rocker arm cover is attached to an internal combustion engine by circumferentially disposed cap screws which extend through a peripheral flange formed on the cover. An elastomeric gasket is disposed between the flange and the engine to form a static seal thereat. An elastomeric, noise-suppressing pad is bonded to an outer surface of the cover and to a plate, overlying the pad. In one embodiment, the pad constitutes a continuous sheet which is substantially coextensive with the top wall of the cover whereas in a second embodiment the pad constitutes an endless strip.

13 Claims, 2 Drawing Figures



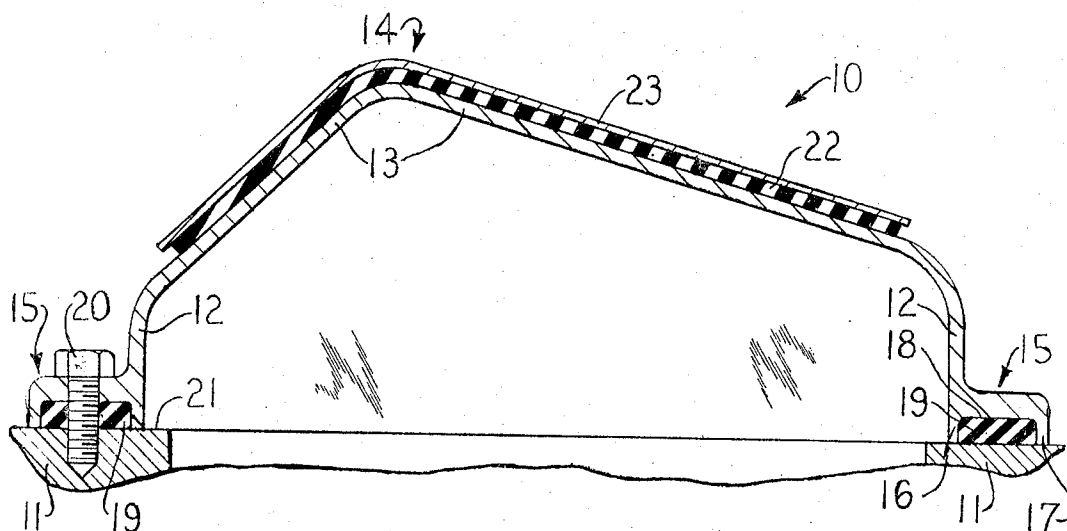


Fig. 1.

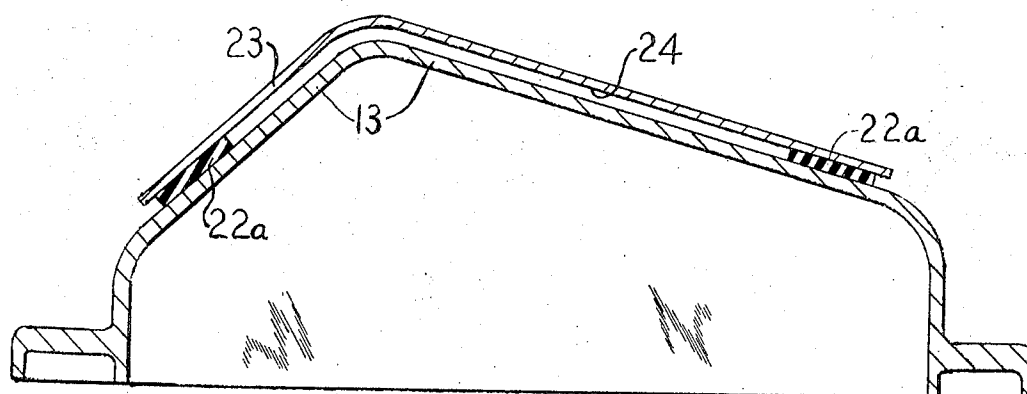


Fig. 2.

ANTI-NOISE ROCKER ARM COVER

BACKGROUND OF THE INVENTION

Rocker arm covers and the like, employed in internal combustion engines, transmit an appreciable amount of noise during engine operation. Since the human ear is most sensitive to a frequency range of from 800Hz to 3,000Hz, many attempts have been made to provide such covers with noise-suppressing means to either reduce the amplitude or to substantially shift noise frequencies outside of such range.

SUMMARY OF THIS INVENTION

An object of this invention is to provide a cover assembly for an engine which substantially suppresses noise levels during engine operation. The cover assembly comprises a cover having a peripheral flange formed thereon and attached to the engine, an elastomeric gasket compressed between the flange and the engine to form a static seal thereat and at least one elastomeric, noise-suppressing pad bonded between the cover and an outer plate.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a transverse, cross sectional view of an anti-noise rocker arm cover assembly attached to an engine; and

FIG. 2 illustrates a modification of the rocker arm cover.

FIG. 1 illustrates a rocker arm cover assembly 10 removably attached to the cylinder head or block of an internal combustion engine 11. The cover completely encloses the rocker arms and attendant mechanisms (not shown) to protect them against damage and to prevent the egress of lubricating oil therefrom. A cover, which may constitute die-cast aluminum or the like, comprises vertical sidewalls 12 and a top wall 13. The top wall preferably forms a inverted V-shape to define a longitudinally extending ridge 14 on the cover assembly.

An inverted U-shaped flange 15 extends transversely from the sidewalls and circumvents the cover assembly. The flange comprises vertically disposed and parallel inner and outer legs 16 and 17 which define a continuous channel 18 having an elastomeric gasket 19 disposed therein. A plurality of attaching means, such as cap screws 20, project through the flange and the gasket for compressing the gasket to form a static seal thereat, completely around the cover assembly. The predetermined degree of compression imparted to the gasket by the cap screws is precisely achieved by stop means comprising the extremities of the legs which are drawn into abutting engagement with a top planar surface 21 of the engine.

FIG. 1 further illustrates an elastomeric, noise-suppressing pad means 22 bonded to an outer surface of cover 13 by a standard bonding agent. The pad means may comprise a continuous sheet of elastomeric material, such as fifty durometer nitrile rubber. The transverse end portions of the pad means terminate closely adjacent to sidewalls 12 of the cover and extend longitudinally thereon substantially the full length of the cover.

A steel plate 23, substantially coterminous with respect to pad means 22 and preferably overhanging the transverse ends thereof, is bonded to an outer surface of the pad means in isolated relationship relative to the

cover. In the preferred embodiment, the first and second wall thicknesses of cover top wall 13 and pad means 22, respectively, are substantially equal (e.g., one-eighth of an inch) and the third wall thickness of plate 23 is substantially one-half of each of such first and second thicknesses (e.g., one-sixteenth of an inch). In another embodiment, the above first thickness is substantially two times the second wall thickness whereas the second wall thickness is substantially two times the third wall thickness.

FIG. 2 illustrates a modification of the FIG. 1 cover assembly embodiment wherein like numerals are employed to depict corresponding structures. In this embodiment, the pad means constitutes an endless elastomeric strip 22a extending longitudinally of the cover closely adjacent the sidewalls 12 and extending transversely at opposite ends of the cover in inwardly marginally spaced relation to the plate 23. A substantially enclosed opening 24 is thus defined centrally of the strip which extends substantially the full length of the cover assembly. Although the above cover assembly embodiment is particularly useful for rocker arm cover applications, it should be understood that the teachings of this invention can be also applied to timing gear covers, oil pans and the like.

What is claimed is:

1. An engine having an anti-noise cover assembly attached thereto, said cover assembly comprising
 - a cover having a peripheral flange formed therearound, said flange forming an inverted U-shape in cross section to comprise vertically disposed and parallel inner and outer legs defining a continuous channel therearound,
 - an elastomeric gasket disposed in said channel between said flange and said engine,
 - releasable attaching means, attaching said cover assembly to said engine, projecting through said flange and said gasket for compressing said gasket to form a seal thereat which circumvents said cover,
 - elastomeric, noise isolating pad means bonded to an outer surface of a top wall of said cover and having transverse end portions thereof terminating closely adjacent to respective transverse sides of said cover, and
 - a plate bonded to an outer surface of said pad means, in isolated relationship relative to said cover.
2. The invention of claim 1 wherein said cover assembly constitutes a rocker arm cover assembly having said top wall forming an inverted V-shape in transverse cross section to define a longitudinally extending ridge on said cover assembly.
3. The invention of claim 1 wherein at least one of said legs abuts said engine to provide stops means for imparting a predetermined degree of compression to said gasket.
4. The invention of claim 1 wherein first and second wall thicknesses of the top wall of said cover and said pad means, respectively, are substantially equal and wherein a third wall thickness of said plate is substantially one-half of each of said first and second wall thicknesses.
5. The invention of claim 1 wherein a first wall thickness of the top wall of said cover is substantially two times a second wall thickness of said pad means and wherein the second wall thickness is substantially two times a third wall thickness of said plate.

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6. The invention of claim 1 wherein said pad means constitutes a continuous sheet.
7. The invention of claim 1 wherein said pad means constitutes an endless strip extending in inwardly marginally spaced relation to said plate.
8. An anti-noise cover assembly comprising
a cover having a peripheral flange formed there-
around, said flange forming an inverted U-shape in
cross section to comprise vertically disposed and
parallel inner and outer legs defining a continuous
channel therearound adapted to retain a gasket
therein,
elastomeric, noise isolating pad means bonded to an
outer surface of a top wall of said cover and having
transverse end portions thereof terminating closely
adjacent to respective transverse sides of said
cover, and
a plate bonded to an outer surface of said pad means,
in isolated relationship relative to said cover.
9. The invention of claim 8 wherein said cover consti-

tutes a rocker arm cover having said top wall forming an inverted V-shape in transverse cross section to define a longitudinally extending ridge on said cover.

10. The invention of claim 8 wherein first and second wall thicknesses of the top wall of said cover and said pad means, respectively, are substantially equal and wherein a third wall thickness of said plate is substantially one-half of each of said first and second wall thicknesses.

11. The invention of claim 8 wherein a first wall thickness of the top wall of said cover is substantially two times a second wall thickness of said pad means and wherein the second wall thickness is substantially two times a third wall thickness of said plate.

12. The invention of claim 8 wherein said pad means constitutes a continuous sheet.

13. The invention of claim 8 wherein said pad means constitutes an endless strip extending in inwardly marginally spaced relation to said plate.

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