April 11, 1961 W. ZUBRO 2,979,038

CRANKCASE VENTILATOR

Filed Aug. 7, 1959

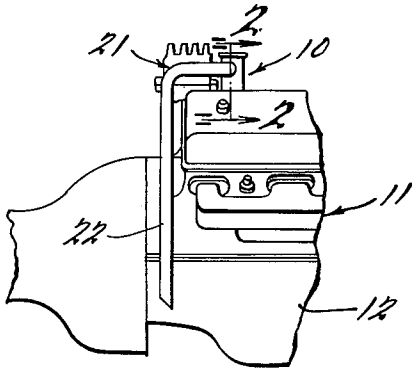


FIG. 1.

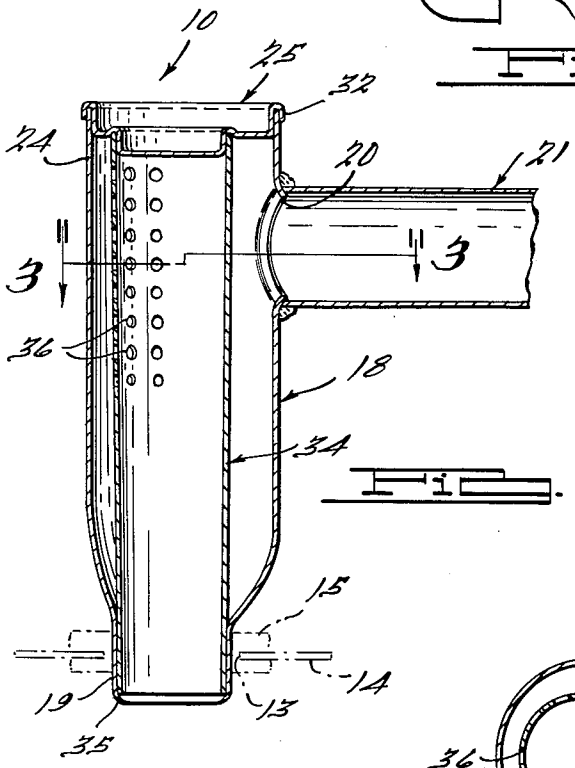


FIG. 2.

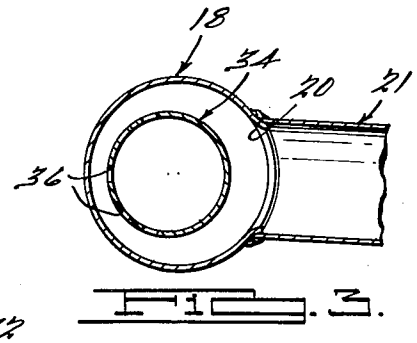


FIG. 3.

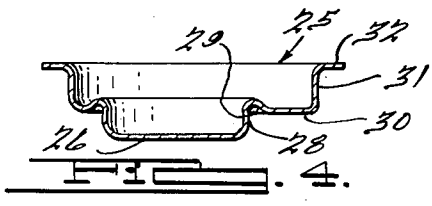


FIG. 4.

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United States Patent Office 2,979,038
Patented Apr. 11, 1961

2,979,038

CRANKCASE VENTILATOR

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Filed Aug. 7, 1959, Ser. No. 832,306

5 Claims. (Cl. 121—194)

This invention relates to an improved crankcase ventilator for an internal combustion engine.

Many types of internal combustion engines require that the crankcase thereof be maintained at approximately atmospheric pressure. A simple aperture in the crankcase wall is unsatisfactory as a venting means because such internal combustion engines often employ the crankcase as an oil sump thereby requiring that the venting means be baffled to restrict the passage of oil fumes outwardly from the crankcase. Further, because the air mass within the crankcase is continuously pulsating at a frequency directly proportional to the speed of the engine, the baffling is preferably orientated so as to muffle pulsations.

Accordingly, one object of the present invention is to provide an improved ventilator for maintaining the crankcase of an internal combustion engine at atmospheric pressure.

Another object is to provide a crankcase ventilator in accordance with the above object that restricts fluid flow between the crankcase and the atmosphere.

Another object is to provide a crankcase ventilator that effectively disperses and muffles pulsations emanating from within the crankcase.

Another object is to provide a crankcase ventilator that is relatively simple in construction and contains a minimum number of parts.

Other objects and advantages of the present invention will become more apparent from the following description wherein reference is made to the drawings, in which:

Figure 1 is a side elevation of a crankcase ventilator, shown in operative association with an internal combustion engine;

Fig. 2 is a cross-sectional view taken along the line 2—2 of Fig. 1, enlarged for clarity;

Fig. 3 is a cross-sectional view taken substantially along the line 3—3 of Fig. 2; and

Fig. 4 is a cross-sectional view of an end closure for the ventilator.

Referring to the drawings, an exemplary embodiment of a crankcase ventilator **10** in accordance with the present invention is shown in operative association with an internal combustion engine **11**. The details of the engine **11** form no part of the present invention and it will be obvious that the crankcase ventilator **10** is capable of utilization with other types of internal combustion engines.

In the embodiment illustrated in Fig. 1, the crankcase ventilator **10** is mounted on top of the engine **11** and extends downwardly into a crankcase **12** thereof through an aperture **13** (Fig. 2) in an upper wall **14** of the crankcase **12**. A suitable gasket **15** is provided within the aperture **13** between the upper wall **14** of the crankcase **12** and the ventilator **10** to seal the aperture **13** against the passage of oil fumes. The ventilator **10** is preferably removable from the aperture **13** to provide for the admission of oil into the crankcase **12** of the engine **11**.

The crankcase ventilator **10** comprises an elongated tubular body member **18** having a necked-down portion **19** at the lower end thereof that is acceptable within the

aperture **13** in the crankcase **12**. The body member **18** has an aperture **20** near the upper end thereof for communication with a transversely extending vent pipe **21** that is secured to the body member **18** as by welding. The vent pipe **21** has an end portion **22** that is folded downwardly so as to conduct any oil fumes that escape through the ventilator **10** outwardly of the engine compartment (not shown). The body member **18** is closed at an upper end **24** thereof by an end closure **25** of stepped cup-shaped configuration. The end closure has a bottom wall **26**, an axially extending side wall **28** that is folded at a re-entrant angle to define an annular recess **29**, a transverse section **30** that extends radially outwardly from the recess **29**, an outer axially extending wall **31** and a radially outwardly extending flange **32** at the upper end thereof. The outer side wall **31** of the end closure **25** is acceptable within the end portion **24** of the body member **18** in nesting relationship and the radially outwardly extending flange **32** is foldable over the upper end portion **24** of the body member **18** (Fig. 1) to secure the end closure **25** to the tubular member **18**.

The ventilator **10** has an inner tube **34** that extends between the end closure **25** and the necked-down portion **19** of the body member **18**. The inner tube **34** is accepted within the necked-down portion **19** in telescoping relation and is positioned by a lip **35** on the lower end of the necked-down portion **19** of the body member **18**. The inner tube **34** accepts the side wall **28** of the end closure **25** in nesting relation and extends into the recess **29** thereof to positively locate the tube **34** with respect to the body member **18**.

The inner tube **34** has a plurality of spaced apertures **36**, of relatively small cross-sectional area, disposed at the opposite side thereof from the aperture **20** in the body member **18**. The apertures **36** restrict the flow of oil fumes outwardly of the crankcase **12**, but are sufficiently large to preclude the creation of a pressure differential between the crankcase **12** and the outside atmosphere. Oil fumes that flow upwardly from the crankcase **12** through the inner tube **34** must pass radially outwardly through the apertures **36** in the tube, then around the inner tube **34** and out the aperture **20** in the body member **18**, then outwardly through the vent pipe **21**. This serpentine path effectively restricts passage of the fumes outwardly of the crankcase. Also, the serpentine path through the ventilator **10** effectively muffles and disperses any air pulsations emanating within the crankcase **12**.

From the foregoing description it should be obvious that the ventilator **10** is of relatively simple construction, yet provides an effective means for ventilating the crankcase of an internal combustion engine and for restricting the flow of fumes and noise outwardly of the crankcase.

While it will be apparent that the embodiments of the invention herein disclosed are well calculated to fulfill the objects of the invention, it will be appreciated that the invention is susceptible to modification, variation and change without departing from the proper scope or fair meaning of the subjoined claims.

What is claimed is:

1. A crankcase ventilator comprising a tubular body member having a necked-down portion at one end thereof, a closure member sealably closing said body member at the other end thereof, an inner tube having a vent means extending between and sealably secured to said closure member and within said necked-down portion and defining an annular chamber within said body member, said body member having an aperture therein, and a vent tube secured to said body member and communicating with said aperture and said vent means to restrict fluid flow outwardly of said crankcase and maintain said crankcase at approximately atmospheric pressure.

2. A crankcase ventilator comprising a tubular body

member having a necked-down portion at one end thereof, a closure member having an axially extending portion sealably secured to said body member at the other end thereof, an inner tube extending between and supported radially and axially with respect to said body member by said axial portion of said closure member and said necked-down portion, said body member having an aperture communicating with an outwardly extending vent tube, and vent means in said inner tube communicating with said aperture in said housing to vent said crankcase to the atmosphere.

3. A crankcase ventilator comprising a tubular body member having an end portion of reduced diameter, a closure member sealably secured to said body member at the other end thereof, an inner tube having an aperture therein extending between and supported by said closure member and the reduced end portion of said body member and defining an annular chamber within said body member, and a vent tube connected to said body member and communicating with said annular chamber for maintaining said chamber and the crankcase at atmospheric pressure.

4. A crankcase ventilator comprising a tubular body member having a necked-down portion at one end and a closure member sealably secured to the other end thereof, an inner tube extending between and supported by said closure member and said necked-down portion of the body member defining an annular chamber within said body member and having an open end portion extending

through said necked-down portion for communication with the crankcase, said inner tube having a plurality of relatively small apertures communicating with said chamber and said body member having a relatively large aperture communicating with said chamber, and a vent tube secured to said body member and communicating with the large aperture therein whereby the crankcase is vented to the outside atmosphere.

5. A crankcase ventilator comprising a tubular body member having a necked-down portion at one end and a closure member at the other end thereof, an inner tube having an open end extending into said necked-down portion in close telescoping relation for communication with the interior of a crankcase, the other end of said inner tube being supported and closed by said closure member, said inner tube defining an annular chamber within said body member and having a vent means communicating with said chamber, said body member having means communicating with said chamber and the atmosphere externally of said crankcase whereby fluid flow outwardly of said crankcase is restricted while said crankcase is maintained at atmospheric pressure.

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