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(54) **TURBOCHARGER COMPRESSOR COVER WITH CONVERTIBLE OUTLET CONNECTION**

(71) Applicant: **Bullseye Power, LLC**, Muskegon, MI (US)

(72) Inventor: **David M. Hall**, Muskegon, MI (US)

(73) Assignee: **Bullseye Power, LLC**, Muskegon, MI (US)

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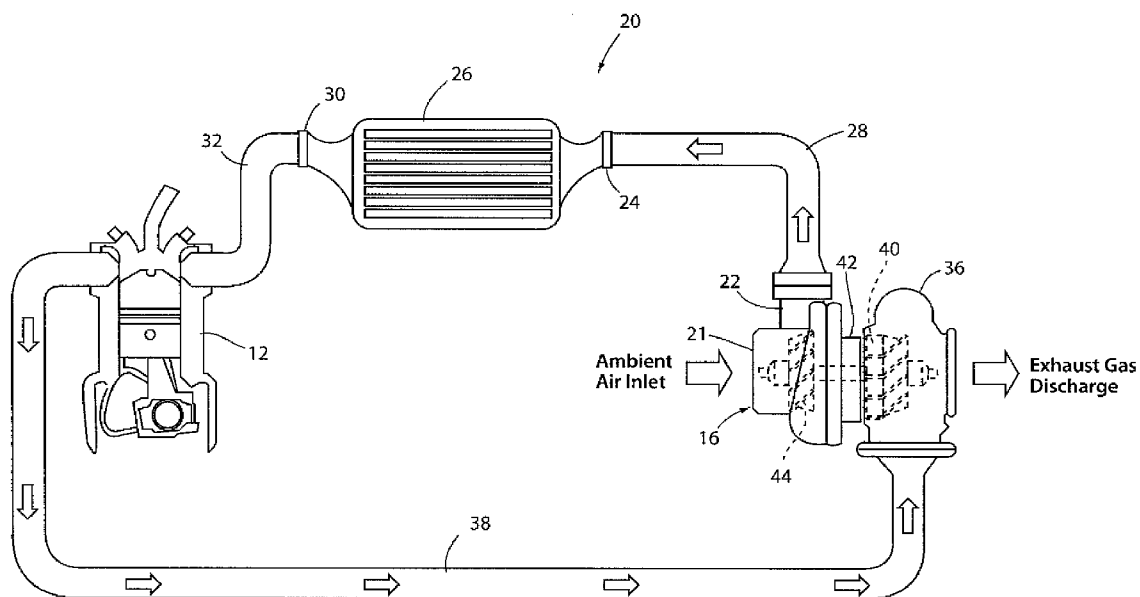
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(57) **ABSTRACT**

A turbocharger housing includes a discharge outlet having a tubular configuration that extends tangentially from a peripheral portion of the housing and an externally threaded section adjacent the end of the discharge outlet to allow the discharge outlet to be connected either to a hose by a hose clamp or to a flanged pipe via an internally threaded flange engaging the externally threaded section of the discharge outlet and a V-band clamp securing the flanges together.



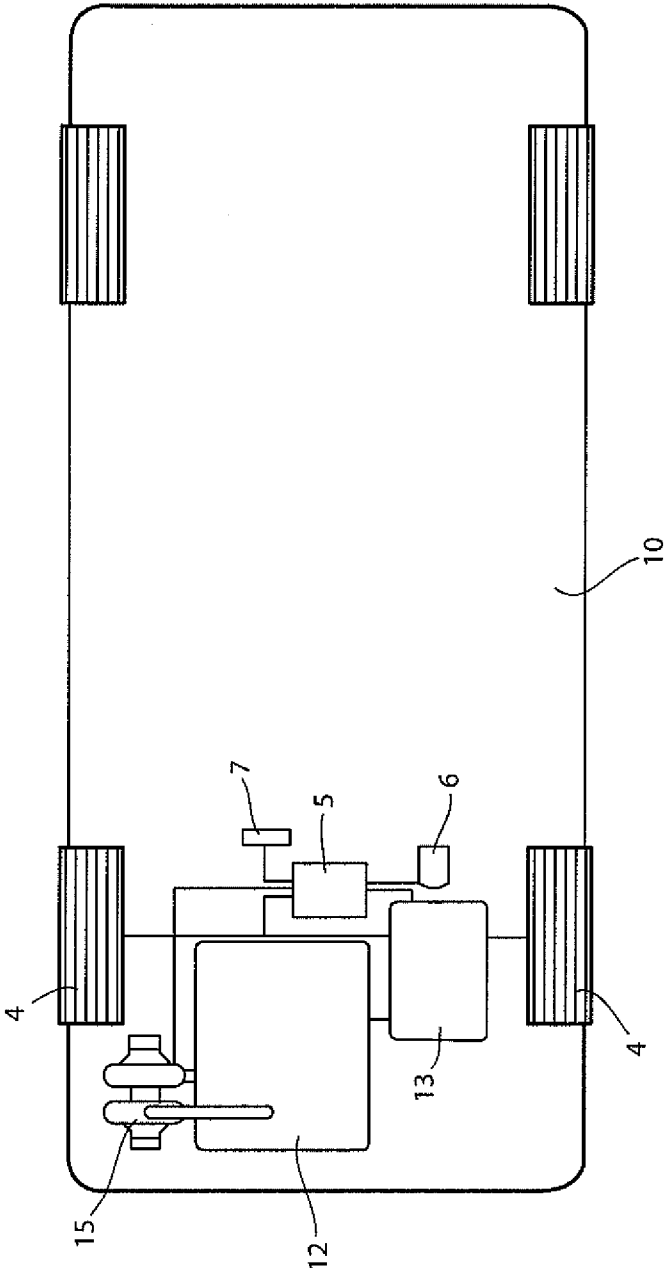


FIG. 1

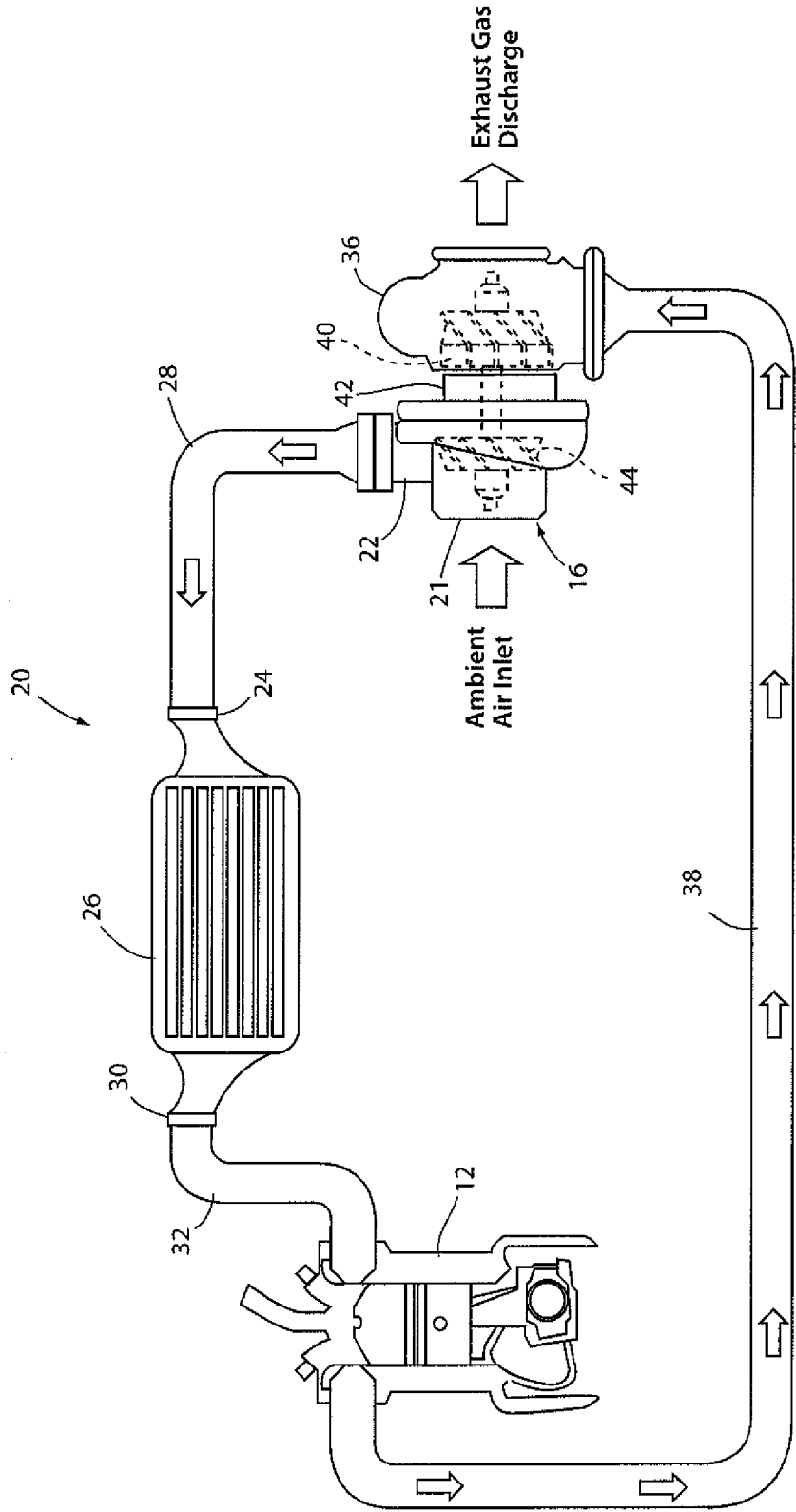


FIG. 2

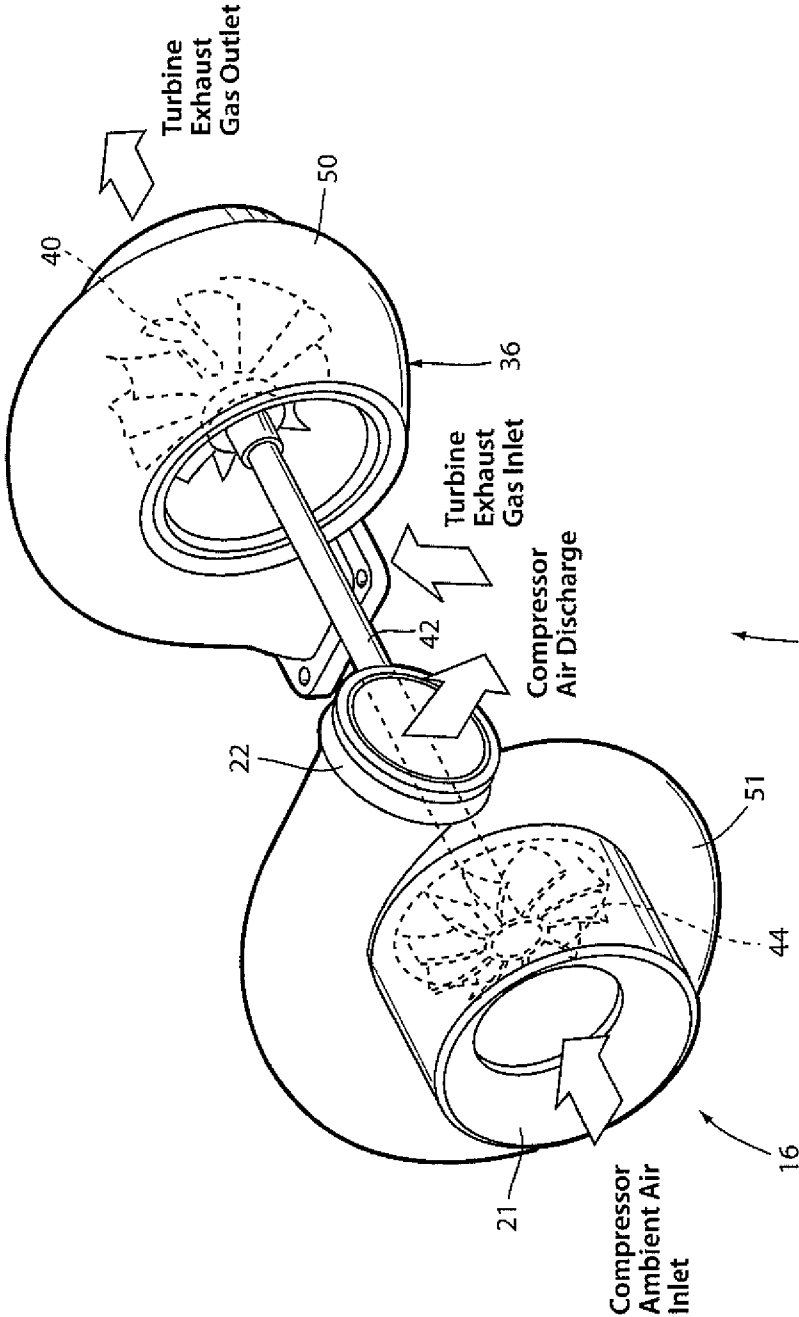
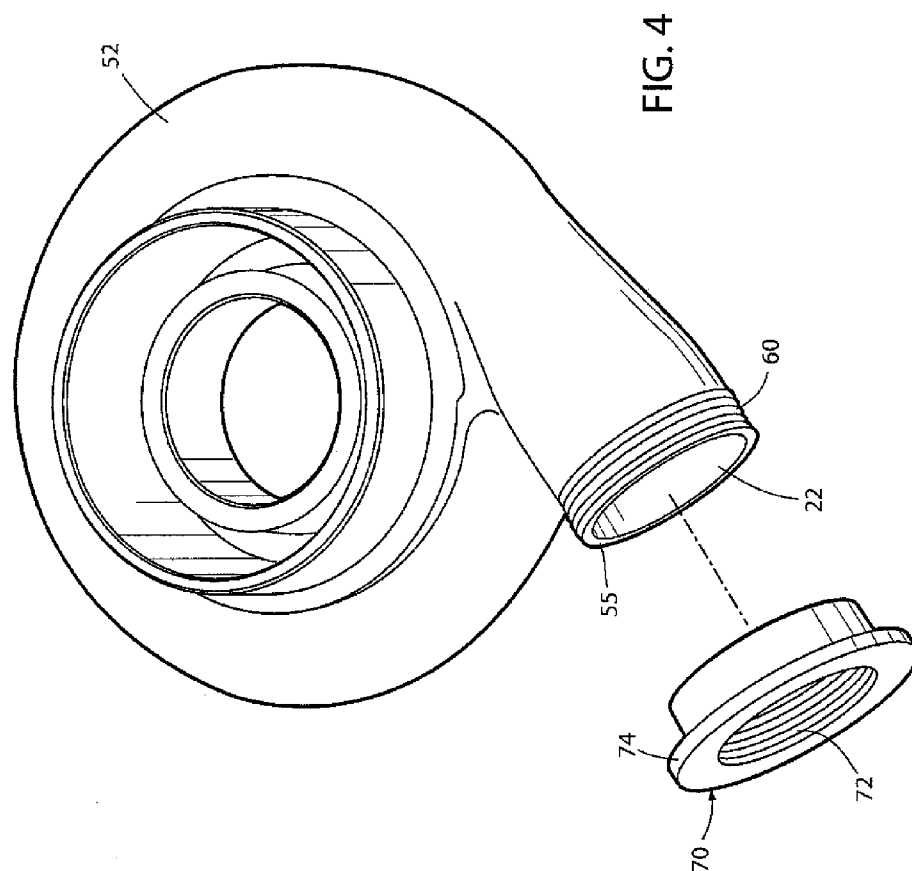


FIG. 3



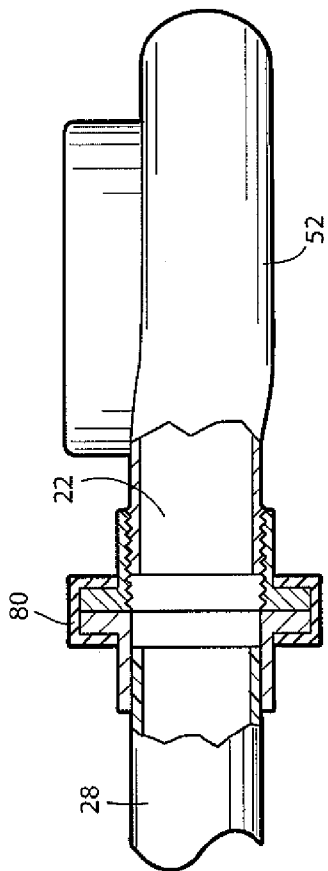


FIG. 5

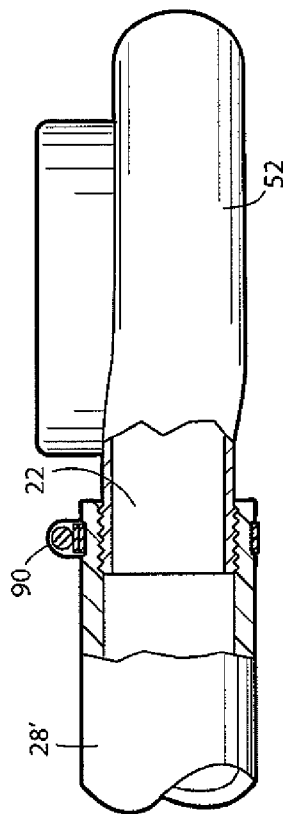


FIG. 6

TURBOCHARGER COMPRESSOR COVER WITH CONVERTIBLE OUTLET CONNECTION

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Not applicable.

FIELD OF THE DISCLOSURE

[0002] This disclosure relates to turbochargers and more particularly to a turbocharger compressor cover having an outlet that can be convertibly configured to be coupled to either an air hose or a flanged pipe that conveys the compressed air to an intercooler before it is conveyed to the air inlet port of an engine.

BACKGROUND OF THE DISCLOSURE

[0003] Turbochargers are forced induction devices used to increase the flow of fresh air into the combustion chamber of an internal combustion engine to increase the efficiency and power of the engine. A turbocharger includes a turbine that is driven by the kinetic energy of the exhaust gas from the engine, and a compressor that is mechanically linked to and driven by the turbine to draw and compress ambient air that is conveyed to the air intake of the engine. Typically, for automotive applications, the pressure increase or boost over ambient pressure is about 6 to 8 pounds per square inch (psig). The discharge outlet from the compressor is typically provided with a smooth circumferential surface to allow the end of a hose to be firmly clamped to the outlet with a T-bolt clamp or worm drive clamp, or a flanged end to allow a pipe to be firmly secured to the discharge outlet using a V-band clamp.

[0004] There are commercially available kits for converting a discharge outlet of a turbocharger compressor from one having a smooth circumferential surface to one having a flanged end. Such kits have generally comprised of flanged fittings that can be welded to the discharge outlet of the turbocharger compressor to facilitate securement to a flanged pipe using a V-band clamp. It is also possible to cut off the flanged end of a discharge outlet of a turbocharger compressor to facilitate attachment of a hose using a T-bolt or worm drive clamp hose clamp. However, it has not been possible to easily switch back and forth between a hose clamp connection and a V-band clamp connection. However, such convertibility is desired by certain motor sports enthusiasts.

SUMMARY OF THE DISCLOSURE

[0005] In accordance with certain aspects of this disclosure, a turbocharger housing component has a discharge outlet that has a tubular configuration that extends generally tangentially from a peripheral portion of the turbocharger housing component, wherein the discharge outlet has an externally threaded section adjacent an end of the discharge outlet. The threaded section allows the compressor housing to be easily converted between a configuration in which a hose clamp (e.g., a T-bolt clamp or worm drive clamp) can be used for securing a hose to the discharge outlet, and a configuration in which an internally threaded flanged fitting can be coupled to the end of the discharge outlet to allow use of a V-band clamp to secure a flanged pipe to the discharge outlet. This arrangement allows greater flexibility during installation of

parts, modifications, maintenance and repairs of a vehicle employing a turbocharger, such as modifications or repairs to the exhaust system.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 is a schematic representation of a vehicle having an internal combustion engine and a turbocharger in accordance with this disclosure.

[0007] FIG. 2 is a schematic representation of a turbocharged internal combustion engine in accordance with this disclosure.

[0008] FIG. 3 is a perspective view of a turbocharger with portions broken away to show internal components.

[0009] FIG. 4 is a top view of a compressor housing component for a turbocharger in accordance with this disclosure.

[0010] FIG. 5 shows a pipe clamped to a fitting threaded onto the discharge outlet of the turbocharger compressor using a V-band clamp.

[0011] FIG. 6 shows a hose clamped to the discharge outlet of the turbocharger compressor using a hose clamp.

DETAILED DESCRIPTION

[0012] Shown in FIG. 1 is a schematic illustration of a vehicle 10 having an internal combustion engine 12 mechanically linked to a transmission 13 that drives wheels 14. A turbocharger 15 is provided to increase the efficiency of and/or the power from the engine 12.

[0013] A turbocharger system 20 is shown in FIG. 2. The system 20 includes turbocharger 15 which includes a compressor 16 that draws ambient air into inlet 21 and discharges compressed air from discharge outlet 22. The compressed air from discharge outlet 22 is conveyed to an air cooler inlet port 24 of an air cooler 26 via pipe 28. Air flows over fins of the cooler 26 as the vehicle moves, cooling the compressed air before it exits cooler 26 from cooler outlet port 30 and is conveyed to an air intake manifold of engine 12 via pipe 32. Combustion products exhausted from engine 12 flow to a turbine 36 via a pipe 38. The exhaust gases turn a turbine wheel 40 that is connected with a shaft 42 that drives a compressor wheel 44.

[0014] Details of turbocharger 15 are shown in FIG. 3. Each of compressor 16 and turbine 36 have a housing 50 and 51, respectively, that define the inlets and outlets for air and combustion products, respectively.

[0015] FIG. 4 is a top view of a cover component 52 of housing 50. The housing cover 52 defines a compressed air discharge outlet 22 that is a tubular-shaped structure that projects outwardly, generally tangentially from a peripheral portion of housing cover component 52. Adjacent the distal end 55 of discharge outlet 22 is a threaded section 60 adapted to receive a flanged, internally threaded fitting 70 having internal threads 72 adapted to engage external threads 60 on discharge outlet 22, and a flange portion 74.

[0016] As shown in FIG. 5, a V-band clamp 80 can be used to secure pipe 28 to outlet 22 of compressor housing component 52 if desired. Alternatively, as shown in FIG. 6, a hose 28' can be secured to outlet 22 using a hose clamp 90.

[0017] While the present invention is described herein with reference to illustrated embodiments, it should be understood that the invention is not limited hereto. Those having ordinary skill in the art and access to the teachings herein will recog-

nize additional modifications and embodiments within the scope thereof. Therefore, the present invention is limited only by the claims attached herein.

What is claimed is:

1. A turbocharger compressor housing component having a discharge outlet, the discharge outlet comprising a tubular portion extending tangentially from a peripheral portion of the turbocharger compressor housing component and having an externally threaded section adjacent an end of the discharge outlet.

2. The turbocharger compressor housing component of claim 1, further comprising an internally threaded flanged fitting that is threadingly engaged with the externally threaded section of the discharge outlet.

3. A vehicle on which is mounted a turbocharger and an internal combustion engine, the turbocharger including a turbine for receiving exhaust gases from the internal combustion engine and transforming kinetic energy of the exhaust gases into mechanical work, a mechanical linkage for using the mechanical work to drive a compressor wheel disposed in a

compressor housing, the compressor housing comprising a discharge outlet for conveying compressed air to an air intake of the internal combustion engine, the discharge outlet defined by a tubular portion which extends tangentially from a peripheral portion of the turbocharger compressor housing, wherein the discharge outlet has an externally threaded section adjacent an end of the discharge outlet.

4. The vehicle of claim 3, further comprising an internally threaded flanged fitting threadingly engaging the externally threaded section of the discharge outlet.

5. The vehicle of claim 4, further comprising a flanged conduit held to the discharge outlet by a V-band clamp.

6. The vehicle of claim 3, further comprising a hose held to the discharge outlet by a hose clamp disposed over an end section of the hose that is disposed over the externally threaded section of the discharge outlet such that the external threads of the discharge outlet bite into the inside surface of the hose.

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