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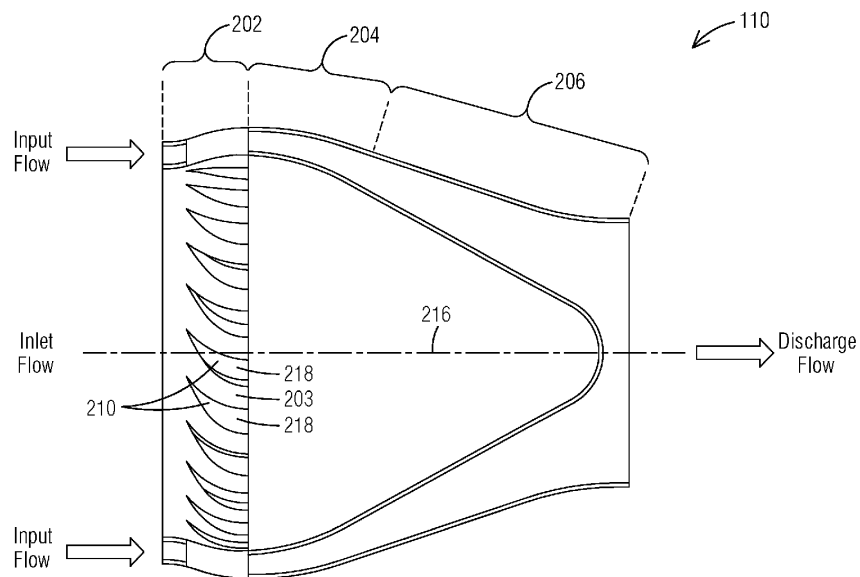
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(54) Title: SUPERSONIC DIFFUSER FOR TURBOMACHINERY ARRANGED TO IMPART THERMAL ENERGY TO A PROCESS FLUID

FIG. 2



(57) Abstract: A supersonic diffuser for use in turbomachinery adapted to impart thermal energy to a process fluid is provided. The diffuser includes a vaned zone configured to define a passageway having a flow area to pass a flow of a process fluid at supersonic velocity. The vaned zone is configured to define a step-change to the flow area of the passageway at a given location, such as where the flow of the process fluid exits the vaned zone. The diffuser further includes a shock zone coupled to the vaned zone to pass the flow of the process fluid that exits the vaned zone. The shock zone is configured to support a system of shock waves that increases static temperature of the process fluid downstream of the system of shock waves. A mixing and subsonic diffusion is configured to decelerate process fluid from the shock zone to a reduced subsonic speed prior to discharge of the process fluid through an exit of the diffuser.

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