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- (72) **Inventor; and**
- (71) **Applicant: CHIU, Kin-Chung Ray** [US/US]; 525 Sirte Terrace, Sunnyvale, California 94089 (US).
- (74) **Agent: BOHLER, William J.**; Law Office of William Bohler, 1314 E. Las Olas Blvd. #645, Fort Lauderdale, Florida 33301 (US).

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(54) **Title:** NON-SEALED VACUUM PUMP WITH SUPERSONICALLY ROTATABLE BLADELESS GAS IMPINGEMENT SURFACE

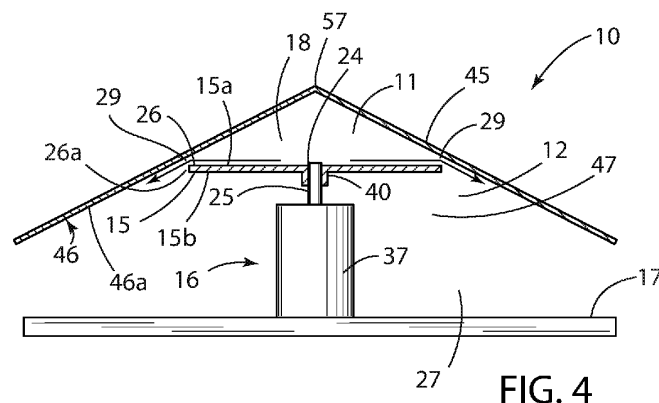


FIG. 4

(57) **Abstract:** A vacuum pump generally comprises a low pressure portion and a high pressure portion separated by a gas impermeable partition. Gas molecules exit the low pressure portion through an opening in the partition and passively impinge on a featureless rotatable surface in the high pressure portion. A drive rotates the rotatable surface with tangential velocity in the supersonic range at multiple times the most probable velocity of the impinging gas molecules. Impinging gas molecules are ejected outwardly from the periphery of the rotatable surface generating a substantial net outward flow of gas and reducing the pressure in the low pressure portion. The vacuum pump is effective to reduce the pressure in the low pressure portion to a target minimum pressure without using seals to prevent gas molecules from leaking back to the low pressure portion and without using blades or vanes to actively impact the gas molecules.



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