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Wells

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(54) **ASYMMETRIC-FIELD ION GUIDING DEVICES**

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(58) **Field of Search** 250/288, 281, 250/292, 282, 287

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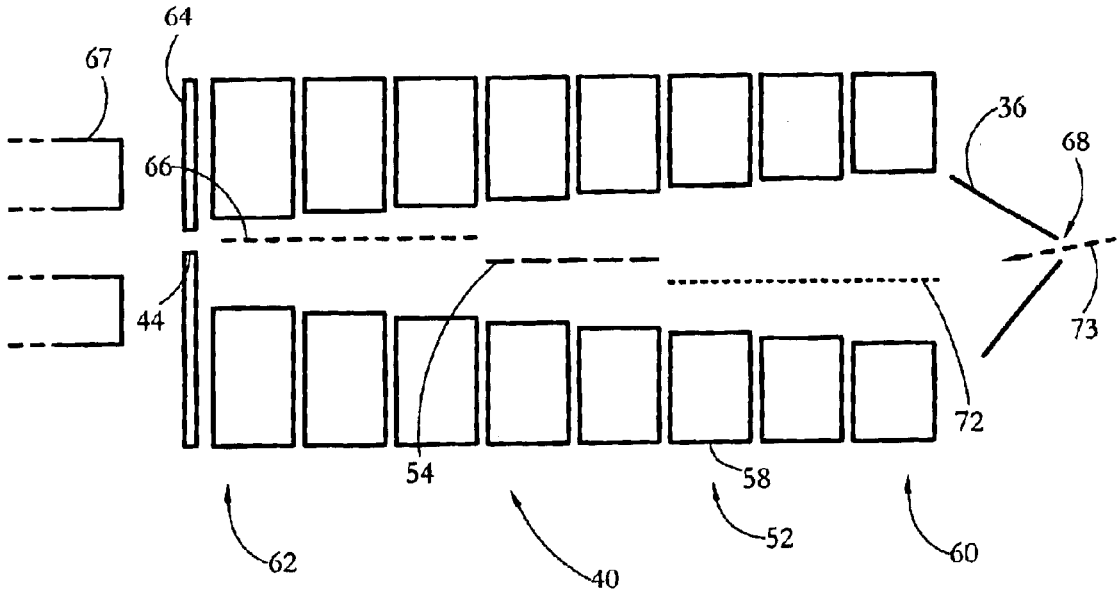
(57) **ABSTRACT**

An electrodynamic ion guide for a mass spectrometer comprises multiple sections having different guiding field central axes. At least one of the guiding fields can be an asymmetric guiding field having a quadrupole component and a dipole component. The ion guide can be positioned in a guide chamber with the first field central axis facing an inlet aperture and the second field central axis facing an outlet aperture. The ion guide allows the efficient use of a guide chamber with no line of sight from the inlet aperture to the outlet aperture, such that undesired liquid droplets entering the guide chamber through the inlet aperture do not exit through the outlet aperture. In the preferred embodiment, the ion guide comprises a plurality of longitudinally-concatenated, progressively narrowing segments, each segment including four flat plates arranged symmetrically about a central geometric axis.

34 Claims, 16 Drawing Sheets