entering the stack through an entrance aperture into tighter beams exiting through a smaller terminal aperture.

13. The device of claim **7**, wherein said apertures have homologous shapes and cross-sectional areas that increase in preselected segments and decrease in other preselected segments along the stack, defining an hourglass ion funnel or a double hourglass ion funnel, wherein regions of said funnels having wider apertures for ion storage are spaced between, or separated by, regions of narrower apertures that provide ion focusing.

14. The device of claim **1**, wherein the electrode elements are built on, or attached to, a preselected surface forming a periodic grating, such that the Dehmelt pseudoforce repels ions from said preselected surface.

15. The device of claim **14**, wherein the preselected surface of the electrode elements is composed of a metal or other electrically-conductive material disposed on an insulating substrate forming the body of the electrode elements.

16. The device of claim **14**, wherein ions are further moved along said preselected surface by a longitudinal electric field derived from a ladder of fixed voltages applied to the electrode elements in superposition with alternating voltages.

17. The device of claim **14**, wherein at least two of said surfaces are disposed at an angle, forming a wedge with an open slit at the apex thereof which compresses a beam of ions entering an open base of the wedge in one dimension, forming a narrower belt-shaped beam exiting through said slit.

18. The device of claim **17**, wherein ions are propelled through said wedge toward the exit by: a longitudinal electric field derived from a ladder of fixed voltages applied to the elements on said surfaces in superposition with alternating voltages, a gas flow resulting from vacuum suction into a following instrument stage, or a combination thereof.

19. The device of claim **18**, wherein said following stage is selected from the group consisting of: a mass spectrometer, an ion mobility spectrometer, a photoelectron spectrometer, a photodissociation spectrometer, and combinations thereof.

20. The device of claim **17**, wherein said device is disposed to receive ions from a linear or elongated rectangular array of elementary sources selected from: an electrospray (ESI) emitter array, or a plate for matrix-assisted laser desorption ionization (MALDI).

21. The device of claim **17**, wherein said device is disposed at or after the terminus of an ion mobility spectrometry (IMS) analyzer to compress ion packets exiting therefrom into a parallelepiped geometry for injection into another instrument stage.

22. The device of claim **17**, wherein said device is disposed at or after the terminus of a differential mobility analyzer (DMA), a differential mobility spectrometry (DMS), or a field asymmetric waveform ion mobility spectrometry (FAIMS) analyzer having a planar or transverse-cylindrical gap geometry to compress the belt-shaped ion beam exiting therefrom for injection into another instrument stage.

23. The device of claim **17**, wherein said belt-shaped ion beam is refocused into a circular or a different cross-sectional shape using a following electrodynamic ion funnel with a gas pressure lower than that inside said wedge.

24. The device of claim **17**, wherein said belt-shaped ion beam is introduced into a subsequent ion mobility spectrometry (IMS) stage in a continuous or pulsed mode, and separated or filtered therein while retaining a rectangular cross section.

25. The device of claim **24**, wherein said IMS stage operates in a mode selected from the group consisting of: drift-tube IMS, traveling-wave IMS, DMA, DMS, FAIMS, and combinations thereof.

26. The device of claim **24**, wherein said device receives ions from a source of linear or elongated-rectangular shape.

27. The device of claim **24**, wherein said belt-shaped beam is further extracted from said IMS stage with compression that retains its rectangular cross section with another device selected from the group consisting of: ion mobility spectrometers, photoelectron spectrometers, photodissociation spectrometers, and combinations thereof.

28. The device of claim **17**, wherein said belt-shaped beam is injected into a subsequent mass spectrometry (MS) stage, in a continuous or pulsed mode, and analyzed therein while retaining a rectangular cross section.

29. The device of claim **28**, wherein said MS stage is a time-of-flight (ToF) mass spectrometer, and the lateral span of said belt-shaped beam is orthogonal to both the directions of ion velocity in MS analysis and ion injection into the ToF instrument.

30. The device of claim **28**, wherein said device receives ions from a source of linear or elongated-rectangular shape.

31. The device of claim **30**, wherein said belt-shaped beam is further injected into a subsequent mass spectrometry (MS) stage and analyzed therein while retaining the rectangular cross section such that the whole IMS/MS separation is performed on a planar ion be.

32. The device of claim **31**, wherein said MS stage is a time-of-flight (ToF) mass spectrometer, and the lateral span of said belt-shaped beam is orthogonal to both the ion velocity vector in MS analysis and the direction of ion injection into the ToF instrument.

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