The ion mass analyzer (IMA) on board Mars Express revealed bundled structures of ions in the energy domain within a distance of a proton gyroradius from the Martian bow shock. Seven prominent traversals during 2005 were examined when the energy-bunched structure is observed together with pick-up ions of exospheric origin, the latter of which is used to determine the local magnetic field orientation from its circular trajectory in the velocity space. These seven traversals represent three different bow shock configurations: quasi-parallel shock, quasi-perpendicular shock with magnetic connectivity to the bow shock, and quasi-perpendicular shock without magnetic connectivity to the bow shock. In all seven cases, multiple ion distributions are observed, each distribution with velocity components which are consistent with multiple specular reflections of the solar wind at the bow shock up to at least two reflections. The accelerated solar wind ion after two specular reflections has large parallel component with respect to the magnetic field for quasi-parallel shocks whereas the parallel component is much smaller than the perpendicular component for quasi-perpendicular shocks. The reflected ions escape when and only when the reflection is in the field-aligned direction.