CLAIMS

[Claim 1]

A linear motor field unit comprising:

a rectangular plate-shaped back yoke;

a plurality of first permanent magnets having a rectangular shape in plan view and juxtaposed on the back yoke with the magnetic pole in alternately opposite directions; and

two second permanent magnets of the same geometry having a polygonal shape in plan view, with the width thereof in the juxtaposition direction narrowed in a tapered manner from one to the other in a direction intersecting with the juxtaposition direction, and arranged at both end portions of the plurality of first permanent magnets in the juxtaposition direction with the tapering direction thereof inverted with respect to each other,

wherein the sum of the width dimension between the ends of each of the second permanent magnets in the juxtaposition direction is approximately equal to the width dimension of the first permanent magnets in the juxtaposition direction.

[Claim 2]

The linear motor field unit according to claim 1, wherein the first permanent magnets are skewed in the juxtaposition direction and wherein the angles of both end portions of the second permanent magnets in the juxtaposed direction are larger than the skew angle of the first permanent magnets.

[Claim 3]

The linear motor field unit according to claim 1 or 2, wherein the ratio of the width dimension between the ends of one of the second permanent magnets in the juxtaposition direction to the other is within the range from 10:1 to 1:1.

[Claim 4]

The linear motor field unit according to any one of claims 1 to 3, wherein the second permanent magnets have a trapezoidal shape in plan view.

[Claim 5]

The linear motor field unit according to claim 1 or 2, wherein the second permanent magnets have an approximately triangular shape in plan view.

[Claim 6]

The linear motor field unit according to any one of claims 1 to 5, wherein the two

second permanent magnets are arranged symmetrically in plan view with respect to a predetermined point on the back yoke.

[Claim 7]

The linear motor field unit according to any one of claims 1 to 6, wherein the second permanent magnets are arranged by dividing one of the first permanent magnets that is configured with a pair of the seven pairs of magnets each including two first permanent magnets whose magnetic poles are opposite direction to each other.

[Claim 8]

A linear motor comprising:

an armature having a rectangular plate-shaped substrate portion and a plurality of magnetic pole teeth with a coil wound therearound juxtaposed on the substrate portion; and

a linear motor field unit according to any one of claims 1 to 7.

[Claim 9]

The linear motor according to claim 8, wherein

the armature includes an auxiliary tooth with no coil wound therearound provided at an end portion of the substrate portion in the juxtaposition direction in a manner spaced from the magnetic pole teeth,

the auxiliary tooth and the magnetic pole teeth are larger at a leading end portion than a base portion thereof, and

the auxiliary tooth and the magnetic pole tooth adjacent to the auxiliary tooth are opposed directly to each other in the juxtaposition direction.

[Claim 10]

The linear motor according to claim 8 or 9, wherein the armature serves as a stator and the linear motor field unit serves as a mover.