CLAIMS

What is claimed is:

1. A filter device, comprising:

a filter comprising a first side wall; and

a magnetic fixing device, comprising:

a body, comprising a first side face and a second side face opposite to the first side face, and a top edge and a bottom edge at two opposite sides of the first side face and the second side face;

a clipping portion, comprising a top flange extending from the top edge along a facing direction of the first side face by a first distance and a clip plate extending from an outer edge of the top flange toward the bottom edge by a second distance, the first side wall being clipped between the clip plate and the first side face; and

a magnetic unit being disposed on the second side face.

2. The filter device according to claim 1, wherein the second distance is less than a length of the body in a same direction.

3. The filter device according to claim 1, wherein the clip plate is disposed at intervals along the body.

4. The filter device according to claim 1, wherein

the body further comprises a bottom flange extending from the bottom edge toward the facing direction of the first side face; and

the filter further comprises a snap-fit member disposed on a face that is of the first side wall and that faces the first side face, the snap-fit member being engaged between the top flange and the bottom flange.

5. The filter device according to claim 1, wherein the second side face further

comprises

a recess, the magnetic unit being engaged in the recess.

6. The filter device according to claim 5, wherein the magnetic fixing device further comprises a top projecting strip extending from the top edge toward the facing direction of the second side face, an edge of the recess being formed by a bottom of the top projecting strip.

7. The filter device according to claim 1, wherein the magnetic unit is disposed at a position adjacent to the top edge.

8. The filter device according to claim 1, wherein the magnetic fixing device further comprises a guiding element, the guiding element comprising a top projecting strip extending from the top edge toward the facing direction of the second side face and a guiding inclined plane extending from an outer edge of the top projecting strip toward the bottom edge and retracting toward the second side face.

9. The filter device according to claim 1, wherein the filter comprises a plurality of wave structures, ridge lines of the wave structures being parallel to a direction in which the first side wall extends.

10. The filter device according to claim 1, further comprising a supporting member disposed on the other side of the magnetic fixing device relative to the filter, the supporting member comprising:

a plate, comprising a third side face toward the magnetic fixing device; and

a supporting portion extending from a position that is of the third side face of the plate and that is adjacent to a lower edge toward the filter and crossing the magnetic fixing device to support the first side wall.

11. The filter device according to claim 10, wherein

the supporting member further comprises a slot disposed on a face opposite to the plate and the third side face; and

a side face of a border has an insert that may be correspondingly inserted into the slot.

12. A filter system, comprising:

a frame, an inner side of the frame having ferromagnetism; and

the filter device according to any of claims 1 to 11.

13. The filter system according to claim 12, wherein the filter system is stacked.

14. The filter system according to claim 12, wherein the frame comprises at least one engaging frame element and at least one ferromagnetic frame element, the at least one engaging frame element and the at least one ferromagnetic frame element being engaged with each other.

15. The filter system according to claim 14, wherein there are at least two engaging frame elements, one end of the at least two engaging frame elements being disposed at two ends of the at least one ferromagnetic frame element, respectively.

16. The filter system according to claim 15, wherein the at least one engaging frame element is L-shaped, and the at least one ferromagnetic frame element is strip-shaped.

17. The filter system according to claim 15, further comprising a fixing plate disposed between the at least two engaging frame elements and located at the other opposite end at which the at least two engaging frame elements are connected to the at least one ferromagnetic frame element.

18. The filter system according to claim 14, wherein there are at least two engaging frame elements and at least two ferromagnetic frame elements.

19. The filter system according to claim 18, wherein the at least two engaging frame elements are U-shaped, and the at least two ferromagnetic frame elements are strip-shaped, the at least two U-shaped engaging frame elements being disposed corresponding to each other, and the at least two ferromagnetic frame elements being connected to the at least

two U-shaped engaging frame elements respectively to form a rectangular frame.

20. The filter system according to claim 14, wherein corresponding tenons are disposed at connecting ends of the at least one engaging frame element and the at least one ferromagnetic frame element

respectively, so that the at least one engaging frame element and the at least one ferromagnetic frame element may be correspondingly engaged.

21. The filter system according to claim 14, wherein a fixing groove is further disposed at an inner wall of the frame and close to a bottom to fix a filter to the frame using a fixing element embedded in the fixing groove.

22. The filter system according to claim 12, wherein the frame comprises:

a plurality of borders, two ends of each border having insertion ports respectively; and

a plurality of connecting members connected to the plurality of borders, each connecting member comprising:

a connecting member body;

a first inserting member extending outward from one side of the connecting member body; and

a second inserting member extending outward from the other side of the connecting member body and forming an angle with the first inserting member;

the first inserting member and the second inserting member of the connecting member being inserted into the insertion port at one end of two adjacent borders respectively to connect the two adjacent borders.

23. The filter system according to claim 22, wherein a groove is disposed on a top side of each border, a bottom side of one of the borders being inserted into the groove of the other border.