

SPECIFICATION

TITLE OF INVENTION

CASE AND HEATING COOKER

5

FIELD OF THE INVENTION

[0001]

The present invention relates to a case and a heating cooker having the case. Especially, the present invention relates to the case configured by engaging an engaged portion of a first member with an engaging portion of a second member to connect the first member and the second member to each other.

10

DESCRIPTION OF THE RELATED ART

15

[0002]

There is known a case in which a board such as a printed circuit board is housed. For example, the case is formed by sandwiching the board between a first member as one case half made of resin and a second member as another case half made of resin and connecting the first member and the second member. When the case is formed by connecting the first member and the second member, in terms of facilitating assembling work and maintenance work, there is adopted a connecting structure formed by inserting an engaging portion of the second member, which has an engaging pawl and is elastically deformable, into an engagement hole of the first member and mating snap fit engagement of the engaging pawl

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with a periphery of the engagement hole (for example, Fig. 4 in Patent Prior Art 1).

[0003]

When an engagement portion is small or the engagement portion is
5 in a retracted position from an outer surface of the case, it is not possible to push the engagement portion by a finger. Therefore, a work tool such as a screw driver is needed to disengage the engagement between the engaging portion and the engaged portion.

[0004]

10 However, when the small engaging pawl is pushed by the work tool, the work tool is displaced from the engaging pawl or the work tool is rotated. As a result, the work tool is unstable during the engagement is disengaged, whereby there is a problem that the work tool tends to damage a peripheral component near the case. Especially, when a worker
15 uses a Phillips-head screwdriver, a tip of the Phillips-head screwdriver is hard to catch on the engaging pawl. Therefore, the above-described problem tends to occur.

[0005]

[Prior Arts]

20 [Patent Document 1] Japanese Unexamined Patent Publication No. JP2017-211153 A.

SUMMARY OF THE INVENTION

[0006]

The present invention has been made to solve the problem described above, and an object of the present invention is to improve workability during an engagement between an engaged portion of a first member and an engaging portion of a second member is disengaged.

5 [0007]

According to the present invention, there is provided a case comprising a first member and a second member connected to each other, wherein

the first member has an engaged portion having an engagement hole,
10 and

the second member has an engaging portion that is inserted into the engagement hole, wherein

the engaging portion has an engaging pawl that protrudes outward from the engagement hole and engages with the engaged portion, when the
15 engaging portion is inserted into the engagement hole,

the engaged portion has an abutting engagement strip portion that extends along an insertion direction of the engaging portion from an abutment surface at a periphery of the engagement hole with which the engaging pawl abuts and engages, and

20 the abutting engagement strip portion has a through groove that extends along the insertion direction of the engaging portion from the abutment surface and penetrates through an outer side surface of the abutting engagement strip portion.

[0008]

According to the present invention, since a work tool is stable during the engagement is disengaged, it is possible to improve the workability.

5 BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

Fig. 1 is a schematic perspective view illustrating a heating cooker to which a case according to an embodiment of the present invention is applied;

10 Fig. 2 is a schematic partial perspective view illustrating the heating cooker to which the case according to the embodiment of the present invention is applied;

Fig. 3 is a schematic exploded perspective view illustrating the case according to the embodiment of the present invention;

15 Fig. 4 is a schematic partial exploded perspective view illustrating the case according to the embodiment of the present invention;

Fig. 5 is a schematic partial perspective view illustrating the case according to the embodiment of the present invention;

20 Fig. 6 is a schematic partial sectional view illustrating the case according to the embodiment of the present invention;

Fig. 7 is a schematic partial perspective view illustrating another example of an upper case according to the embodiment of the present invention; and

Fig. 8 is a schematic partial perspective view illustrating another example of a lower case according to the embodiment of the present invention.

5 DETAILED DESCRIPTION OF THE EMBODIMENTS

[0010]

Hereinafter, an operation display device of a cooking stove of an embodiment to which a case of the present invention is applied will be described. Fig. 1 is a schematic perspective view illustrating a drop-
10 in cooking stove 1 which is installed into a countertop of a built-in kitchen. The drop-in cooking stove 1 has a cooking stove main body (not illustrated) and a glass top plate 100 covering an upper part of the cooking stove main body.

[0011]

15 Although not illustrated, the top plate 100 is provided with cooking openings. Burner main bodies of gas burners 8 are accommodated in the cooking stove main body. A burner head 80 of the gas burner 8 protrudes upward from the cooking opening of the top plate 100. On a front side of an upper surface of the top plate 100, operation switches
20 101 operating the gas burners 8 are provided. Further, around the burner head 80, a trivet 81 for mounting a cooking container over the burner head 80 is disposed.

[0012]

As illustrated in Figs. 1 and 2, the top plate 100 is provided
25 with a transparent transmitting window 110. An user can see a display

panel 90 with seven segments of the operation display device 2 provided on a lower surface of the top plate 100 through the transmitting window 110. Although not illustrated, the top plate 100 around the transmitting window 110 is provided with an insertion hole into which a switch main body of the operation switch 91 of the operation display device 2 is inserted from a lower side. A screw portion is formed on an upper surface of the operation display device 2 at a lower end peripheral edge of the operation switch 91. The operation display device 2 is attached to the lower surface of the top plate 100 by inserting the switch main body into the insertion hole from the lower side of the top plate 100 and then threading a decorative nut on the screw portion from an upper surface side of the top plate 100 in a state that the switch main body protrudes upward from the upper surface of the top plate 100. In the present invention, an operation side on which the user operates the drop-in cooking stove 1 is referred to as a front side, and when viewed the drop-in cooking stove 1 from the front side, a depth direction is referred to as a front-back direction, a width direction is referred to as a left-right direction, and a height direction is referred to as an up-down direction. These expressions indicating directions and positions are used for convenience of description, and will not limit the present disclosure. Note that when the top plate 100 is made of a transparent material such as a glass, the transmitting window 110 may not be formed.

[0013]

As illustrated in Figs. 2 and 3, the operation display device 2 has a case 3 and a printed circuit board 9 housed in the case 3. The case 3 is formed by connecting an upper case 4 (a first member) made of resin and a lower case 6 (a second member) made of resin. The upper case 4 and the lower case 6 is vertically separable from each other. The printed circuit board 9 has: the switch main body of the operation switch 91 protruding upward from the upper case 4; and the display panel 90 with the seven segments exposing from an opening of the upper case 4. The printed circuit board 9 is fastened to the upper case 4 by a fastening member 93 equipped with a cross-shaped groove such as a cross-slot screw or a cross-slot bolt. For example, by operating the operation switch 91, a timer is set and a timer time is displayed on the display panel 90.

[0014]

The upper case 4 is formed of a flat box and is open downward. The upper case 4 has a rectangular flat upper plate 40, a front plate 41, a back plate 42, a left plate 43, and a right plate 44. Each of the front, back, left, and right plates 41, 42, 43, 44 extends downward from a peripheral edge of the upper plate 40. Both end portions in the left-right direction of the front plate 41 of the upper case 4 is provided with guide holes 410. An engagement piece 610 extending upward from a front wall 61 of the lower case 6 described later is inserted into the guide hole 410. An outer side surface of the front wall 41 is provided with a beam portion 411 connecting both ends in the left-right direction of the guide hole 410 so as to cover a lower half portion of the guide

hole 410. A hook portion 611 provided at a distal end of the engagement piece 610 of the lower case 6 described later engages with the beam portion 411. Note that including the left and right guide holes 410, elements of a left engagement structure are the same as those of a right engagement structure except that those positions differ from each other. Therefore, common elements are assigned common reference numerals, and the elements of one of the engagement structures are mainly explained below.

[0015]

As illustrated in Figs. 2 to 4, both end portions in the left-right direction of a backward portion of the upper case 4 are respectively cut out in a U shape from a vicinity of a back end of the upper plate 40 to a center portion in the up-down direction of the back plate 42 in a manner straddling the upper plate 40 and the back plate 42. Further, a lower surface of the upper plate 40 is provided with a front peripheral wall 46, a left peripheral wall 47, and a right peripheral wall 48, which extend downward from an upper end of a cut out portion to a vicinity of a lower end of the back plate 42. Therefore, the both end portions in the left-right direction of the backward portion of the upper case 4 are respectively provided with a recessed portion 45 and a tunnel shape through hole (hereinafter, referred to as "engagement hole 51") continuously formed in the up-down direction. The recessed portion 45 is surrounded by upper portions of the front, left and right peripheral walls 46, 47, 48, and is open backward, upward, and downward. The engagement hole 51 is surrounded by lower portions of the

front, left and right peripheral walls 46, 47, 48 and part of a lower portion of the back plate 42, and is open upward and downward. An engaging portion 70 of the lower case 6 described later is inserted into the engagement hole 51 from below. Further, an engaging pawl 71
5 provided at an upper end of the engaging portion 70 described later abuts and engages with an upper end surface (hereinafter, referred to as "abutment surface 52") of the back plate 42 forming a periphery of an upper opening of the engagement hole 51. Therefore, according to the case 3, an engaged portion 50 is formed of the lower portions of the
10 front, left and right peripheral walls 46, 47, 48 and part of the lower portion of the back plate 42 (hereinafter, referred to as "abutting engagement strip portion 53"), as parts of forming the engagement hole 51.

[0016]

15 The abutting engagement strip portion 53 forming part of the engagement hole 51 has a through groove 55 linearly cut out from a center portion in the left-right direction of the abutment surface 52 to a predetermined position above a lower end thereof (i.e., the lower end of the back plate 42). The through groove 55 penetrates from an outer
20 side surface 530 of the abutting engagement strip portion 53 to an inside of the engagement hole 51 to form a slit groove. Therefore, the inside and an outside of the engagement hole 51 communicate with each other through the through groove 55. A length and a width of the through groove 55 of the abutting engagement strip portion 53 are set
25 such that part of a tip of the Phillips-head screwdriver (for example,

PH Tip 2 described in ISO-8764-1:2004(E)) can be inserted into the through groove 55. For example, the length of the through groove 55 is 2 to 3 mm and the width of the through groove 55 is 1.5 to 2.5 mm. In a case where the above-described through groove 55 into which the tip of the general-purpose Phillips-head screwdriver can be inserted is formed, the work tool which is the same as one used to fasten the printed circuit board 9 to the upper case 4 by the above-described fastening member 93 equipped with the cross-shaped groove can be used to disengage the engagement. With this configuration, attachment/detachment of the printed circuit board 9 and disengagement of the engagement can be operated by one single work tool. Note that the width of the through groove 55 may be set such that not only part of the tip of the Phillips-head screwdriver but the tip can be inserted into the through groove 55. With this configuration, it is possible to prevent from displacing the work tool by a left wall and a right wall of the through groove 55.

[0017]

The lower case 6 has a flat plate shape. The lower case 6 has: a rectangular lower wall 60; a front wall 61 extending upward from a front side edge of the lower wall 60; a back wall 62 extending upward from a back side edge of the lower wall 60 to a predetermined position lower than the front wall 61; a left wall 63 extending upward from a left side edge of the lower wall 60 to a predetermined position lower than the front wall 61; and a right wall 64 extending upward from a right side edge of the lower wall 60 to a predetermined position lower than the front wall 61. Further, a step portion 65 protruding upward from the

lower wall 60 to the same height as an upper end of the front wall 61 is formed at an area inward than peripheral edges of the left, right and back walls 63, 64, 62 on an upper surface side of the lower wall 60 of the lower case 6. It is thus that the lower case 6 is provided with a flange portion extending outward from a lower end periphery of the step portion 65. The step portion 65 fits into the left, right, and back plates 43, 44, 42 of the upper case 4 when the upper case 4 and the lower case 6 is connected to each other.

[0018]

Both end portions in the left-right direction of the front wall 61 of the lower case 6 are respectively provided with the L-shaped engagement piece 610 extending upward (i.e., an upper case 4 side in an engagement state) from the upper end of the front wall 61. A hook portion 611 extending to be bent frontward is formed at an upper end portion of the engagement piece 610. The engagement piece 610 is inserted into the above-described guide hole 410 formed at the front plate 41 of the upper case 4 when the upper case 4 and the lower case 6 is connected to each other. Further, the hook portion 611 engages with the above-describe beam portion 411 when the engagement piece 610 is inserted into the guide hole 410.

[0019]

Both end portions in the left-right direction of the back wall 62 of the lower case 6 are shallowly cut out frontward, respectively. Both end portions in the left-right direction of a backward portion of the lower wall 60 of the lower case 6 are respectively provided with the

engaging portion 70 in a L-shaped plate extending upward (i.e., the upper case 4 side in the engagement state) from a cut out portion beyond the step portion 65. The engaging pawl 71 extending to be bent backward is formed at an upper end portion of the engaging portion 70. The engaging portion 70 is inserted into the above-described engagement hole 51 when the upper case 4 and the lower case 6 are connected to each other. The engaging portion 70 protruding frontward beyond the step portion 65 has elastic deformability in the front-back direction with an upper end of the step portion 65 as a fulcrum.

[0020]

A width of the engaging portion 70 is set to be slightly less than a width of the engagement hole 51 such that the engaging portion 70 is inserted into the engagement hole 51. Both end portions in the left-right direction of the engaging pawl 71 are respectively provided with: an inclined surface 72 which is inclined outward so as to increase in thickness from an upper end 77 side (a distal end side) of the engaging pawl 71 toward a proximal end side of the engaging portion 70; a flat surface 73 extending linearly downward from a top of the inclined surface 72 with a uniform thickness; and a raised surface (hereinafter, referred to as "engagement surface 74") extending from a lower end of the flat surface 73 to be bent frontward (see Fig. 6). The inclined surface 72 of the engaging pawl 71 is inserted into the engagement hole 51 while in sliding contact with an inner surface of the back plate 42 forming the engagement hole 51. It is thus that the engaging portion 70 can be smoothly inserted into the engagement hole 51. When the engaging

portion 70 is inserted into the engagement hole 51 to a final position,
the engaging pawl 71 protrudes outward from an upper opening the
engagement hole 51 and the engagement surface 74 of the engaging pawl 71
abuts and engages with the abutment surface 52 of the abutting
5 engagement strip portion 53 forming part of the engagement hole 51.
[0021]

A central portion in the left-right direction of the engaging pawl
71 is provided with a recessed groove 75 linearly cut in along the up-
down direction which is an extending direction of the engaging portion
10 70. The recessed groove 75 is formed from the engagement surface 74 to
the upper end 77 of the engaging pawl 71. For example, a length of the
recessed portion 75 is 1.5 to 2 mm, a width of the recessed portion 75
is 1.5 to 2.5 mm, and a depth of a deepest portion of the recessed
portion 75 is 0.5 to 1.5 mm. Further, the width of the recessed portion
15 75 is set to be the substantially same as one of the through groove 55
formed in the abutting engagement strip portion 53 of the upper case 4.
When the engaging portion 70 is inserted into the engagement hole 51 and
the engagement surface 74 of the engaging pawl 71 abuts and engages with
the abutment surface 52 of the abutting engagement strip portion 53, the
20 recessed groove 75 of the engaging pawl 71 and the through groove 55 of
the abutting engagement strip portion 53 are in communication with one
another in the up-down direction which is the extending direction of the
engaging portion 70. It is thus that in the engagement state, the
through groove 55 and recessed groove 75 forms a communication groove,
25 which is long in the up-down direction and is open outward. Further,

the engagement surface 74 of the engaging pawl 71 abuts and engages with the abutment surface 52 of the abutting engagement strip portion 53 such that the communication groove is aligned orthogonal to the flat surface 73 of the engaging portion 71 (see Fig. 5). A bottom surface of the
5 recessed groove 75 is flat.

[0022]

As illustrated in Figs. 5 and 6, the engaging pawl 71 is formed such that in the engagement state, the engagement surface 74 engages with the abutment surface 52 at a position located forward of a back end
10 of the abutment surface 52 (i.e., the outer side surface 530 of the abutting engagement strip portion 53). As a result, in the engagement state, the flat surface 73 of the engaging pawl 71 is located inward of the outer side surface 530 of the abutting engagement strip portion 53. Therefore, a gap having a certain size is formed between the flat
15 surface 73 and the outer side surface 530 of the abutting engagement strip portion 53.

[0023]

As illustrated in Fig. 4, when the upper case 4 and the lower case 6 is connected to each other, the upper case 4 and the lower case 6 are
20 arranged such that a lower surface on an opening side of the upper case 4 and an upper surface on a protruding side of the engaging portion 70 of the lower case 6 face each other. Then, the engagement piece 610 protruding upward from the front wall 61 of the lower case 6 is inserted into the guide hole 410 of the upper case 4 to engage the hook portion
25 611 with the beam portion 410. Further, the engaging portion 70

protruding upward from the lower wall 60 of the lower case 6 is inserted into the engagement hole 51 of the upper case 4. At this time, since the engaging portion 70 is an elastic body that is elastically deformable in the front-back direction orthogonal to an insertion direction of the engaging portion 70, the engaging portion 70 is elastically deformed so as to be bent frontward. Further, the engaging pawl 71 moves upward while in sliding contact with the inner surface of the abutting engagement strip portion 53. As illustrated in Figs, 2, 5 and 6, when the engaging pawl 71 passes through the engagement hole 51 and the engaging pawl 71 protrudes outward from the engagement hole 51, the engaging pawl 71 moves backward due to elastic reaction force of the engaging portion 70. As a result, a lower end surface (i.e., the engagement surface 74) of the engaging pawl 71 abuts an upper end surface (i.e., the abutment surface 52 at the periphery of the upper opening of the engagement hole 51) of the abutting engagement strip portion 53, so that the engaging portion 70 engages with the engaged portion 50.

[0024]

As illustrated in Figs. 5 and 6, when the upper case 4 and the lower case 6 are separated from each other, a tip of the work tool is brought into contact with an engagement portion from a backside. For example, among blades in a cross shape of the Phillips-head screwdriver 10, two blades lined up in one direction are inserted into the communication groove formed by the through groove 55 and the recessed groove 75, and other two blades lined up in a direction orthogonal to

the one direction are brought into contact with the flat surface 73.

Then, the engagement can be disengaged by pushing the work tool to the engaging pawl 71 toward the upper case 4 side, in a state that part of the tip of the work tool is inserted into the communication groove.

5 [0025]

According to the present embodiment, the abutting engagement strip portion 53 of the engaged portion 50 of the upper case 4 extends toward a lower case 6 side along the insertion direction of the engaging portion 70 from the abutment surface 52 with which the engaging pawl 71 of the engaging portion 70 of the lower case 6 abuts and engages.

Further, the abutting engagement strip portion 53 has the through groove 55 penetrating through the outer side surface 530 thereof. Therefore, the work tool can be easily inserted into the through groove 55 from the outside of the case 3. Further, since the through groove 55 extends from the abutment surface 52 with which the engaging pawl 71 abuts and engages, the tip of the work tool easily catches on the engaging pawl 71. Further, since the tip of the work tool is inserted into the through groove 55, it is possible to prevent from displacing and rotating the work tool. With this configuration, during the engagement is disengaged, it is possible to be stable the work tool. Accordingly, it is possible to improve workability. Further, even when the case 3 is attached to the glass top plate 100, it is possible to disengage the engagement smoothly while damage on the top plate 100 is avoided. Accordingly, the heating cooker excellent in workability can be provided.

[0026]

Further, according to the present embodiment, in the engagement state of the engaging portion 70 and the engaged portion 50, the through groove 55 and the recessed groove 75 communicate with one another in the insertion direction of the engaging portion 70 to form the communication groove. Therefore, it is possible to easily insert the tip of the work tool into the communication groove from the outside of the case 3.

Further, the tip of the work tool is more likely to catch on the engaging pawl 71 by the communication groove. Therefore, it is possible to further prevent from displacing and rotating the work tool. Further, not only a flat-head screwdriver but the general-purpose Phillips-head screwdriver can be used during the engagement is disengaged, and part of the blades of the Phillips-head screwdriver can be inserted into the communication groove to push the engaging pawl 71 toward a disengagement direction. With this configuration, it is possible to further improve the workability.

[0027]

Note that only the recessed groove 75 may be formed between the engagement surface 74 of the engaging pawl 71 and the upper end 77 of the engaging pawl 71 without forming the through groove 55 in the abutting engagement strip portion 53 of the engaged portion 50. Such an engaging portion 70 allows to easily insert the tip of the work tool into the recessed groove 75 from the outside of the case 3.

[0028]

Further, according to the present embodiment, since the flat surface 73 of the engaging pawl 71 can be pushed by the tip of the work tool, it is possible to further prevent from displacing and rotating the work tool. Particularly, according to the present embodiment, the flat surface 73 is placed adjacent to the recessed groove 75, and the communication groove formed by these grooves 55, 75 is orthogonal to the flat surface 73 of the engaging pawl 71 in the engagement state. Thus, among the blades in the cross shape of the Phillips-head screwdriver, when the two blades lined up in the one direction are inserted into the communication groove, the other two blades lined up in the direction orthogonal to the one direction about the flat surface 73. With this configuration, it is possible to further prevent from displacing and rotating the work tool. Further, the gap having the certain size in the insertion direction of the work tool is formed between the flat surface 73 of the engaging pawl 71 and the outer side surface 530 of the abutting engagement strip portion 53. Therefore, the abutment surface 52 serves as a support platform that supports the work tool. With this configuration, it is possible to be more stable the work tool and to further improve the workability.

[0029]

Further, according to the present embodiment, during the engagement is disengaged, the work tool which is the same as one used for attachment and detachment of an accommodated component can be used. Therefore, since there is no need to change the work tool, it is possible to further improve the workability.

[0030]

Note that the present invention is not restricted to the embodiment described above, but many variations are possible within the scope of the inventive idea defined by the claims. For example, the present invention includes modifications described below or all of configurations obtained by combining these forms with each other. In Figs. 7 and 8, similar reference numerals are used to denote similar elements which are similarly to those of the case 3 described above.

[0031]

As illustrated in Fig. 7, a through groove 55a of an abutting engagement strip portion 53a of an engaged portion 50a may be formed so as to penetrate through an entire abutting engagement strip portion 53a along the insertion direction of the above-described engaging portion 70. If such a through groove 55a is formed, it is possible to easily insert the work tool into the through groove 53a from the outside of the case 3.

[0032]

Further, as illustrated in Fig. 8, a recessed groove 75a of an engaging pawl 71a may be formed from an engagement surface 74a to a predetermined position located before an upper end 77a of the engaging pawl 71a and a standing wall portion 78 extending in a thickness direction of the engaging pawl 71a may be formed between the upper end 77a of the engaging pawl 71a and a distal end 750 of the recessed groove 75a. If such an engaging pawl 71a is formed, the work tool is less likely to come out of the recessed groove 75a by the standing wall

portion 78 when the tip of the work tool fits into the recessed groove 75a. With this configuration, during the engagement is disengaged, it is possible to further prevent from displacing and rotating the work tool. Note that an inclined surface like the inclined surface 72 may be formed on an upper end 77a side of the standing wall portion 78 to facilitate insertion of the engaging portion 70a into the engaged portion 50.

[0033]

Although not illustrated, the recessed groove 75 may be formed such that its depth becomes deep from the distal end of the recessed groove 75 toward the engagement surface 74. If such a recessed groove 75 is formed, the tip of the work tool fits into the bottom surface of the recessed groove 75 and the work tool is less likely to slip in the recessed groove 75 when a stick type work tool having a tapered tip in a triangular shape is inserted into the recessed groove 75. With this configuration, during the engagement is disengaged, it is possible to further prevent from displacing and rotating the work tool.

[0034]

Further, when the case 3 and a peripheral component at a periphery of the case 3 are connected to each other by the fastening member equipped with the cross-shaped groove, each of the widths of the through groove 55 and the recessed groove 75 may be wider than a width of a wing of the cross-shaped groove of the fastening tool. Further, as long as the engaging portion 70 is elastically deformable, the lower case 6 may be formed of other materials such as a rubber material or a metal

material. Further, as long as the work tool is inserted into the recessed groove 75, the recessed groove 75 may have any shape such as a circle shape or a cross shape. Further, part of the recessed groove 75 may penetrate through the engaging portion 70 in the thickness direction. Further, any component other than the board may be housed in the case 3. Further, the case 3 may be applied not only to the drop-in cooking stove 1 but to other heating cookers such as a built-in cooking stove or an oven cooker.

[0035]

As described in detail, the present invention is summarized as follows.

According to a first aspect of the present technology, there is provided a case comprising a first member and a second member connected to each other, wherein

the first member has an engaged portion having an engagement hole, and

the second member has an engaging portion that is inserted into the engagement hole, wherein

the engaging portion has an engaging pawl that protrudes outward from the engagement hole and engages with the engaged portion, when the engaging portion is inserted into the engagement hole,

the engaged portion has an abutting engagement strip portion that extends along an insertion direction of the engaging portion from an abutment surface at a periphery of the engagement hole with which the engaging pawl abuts and engages, and

the abutting engagement strip portion has a through groove that extends along the insertion direction of the engaging portion from the abutment surface and penetrates through an outer side surface of the abutting engagement strip portion.

5 [0036]

According to the first aspect described above, the abutting engagement strip portion of the engaged portion extends along the insertion direction of the engaging portion from the abutment surface with which the engaging pawl abuts and engages. Further, the abutting engagement strip portion has the through groove penetrating through the outer side surface thereof. Therefore, a work tool can be easily inserted into the through groove from the outside of the case. Further, since the through groove extends from the abutment surface with which the engaging pawl abuts and engages, a tip of the work tool easily catches on the engaging pawl. Further, since the tip of the work tool is inserted into the through groove, it is possible to prevent from displacing and rotating the work tool. With this configuration, since it is possible to be stable the work tool during an engagement is disengaged, it is possible to improve workability.

20 [0037]

According to a second aspect of the present technology, in the first aspect described above,

the engaging pawl has a recessed groove that extends toward a distal end of the engaging pawl from an engagement surface of the engaging pawl,

the engagement surface abuts and engages with the abutment surface, and

the through groove of the abutting engagement strip portion and the recessed groove of the engaging pawl are formed such that those
5 grooves are in communication with one another in the insertion direction of the engaging portion, when the engagement surface of the engaging pawl abuts and engages with the abutment surface of the abutting engagement strip portion.

[0038]

10 According to the second aspect described above, in an engagement state of the engaging portion and the engaged portion, the through groove and the recessed groove communicate with one another in the insertion direction of the engaging portion to form the communication groove. Therefore, it is possible to easily insert the tip of the work
15 tool into the communication groove from the outside of the case. Further, the tip of the work tool is more likely to catch on the engaging pawl by the communication groove. Therefore, it is possible to further prevent from displacing and rotating the work tool. Further, during the engagement is disengaged, part of blades of a general-purpose
20 Phillips-head screwdriver as a fastening work tool can be inserted into the communication groove to push the engaging pawl toward a disengagement direction. With this configuration, it is possible to further improve the workability.

[0039]

According to a third aspect of the present technology, in the first or second aspect described above,

the engaging pawl has a flat surface that has a uniform thickness and extends from the engagement surface of the engaging pawl toward the distal end of the engaging pawl.

[0040]

According to the third aspect described above, the flat surface of the engaging pawl can be pushed by the tip of the work tool. With this configuration, it is possible to further prevent from displacing and rotating the work tool, during the engagement is disengaged.

[0041]

According to a fourth aspect of the present technology, in the third aspect described above,

the flat surface is formed so as to be aligned orthogonal to the through groove of the abutting engagement strip portion and the recessed groove of the engaging pawl, when the engagement surface of the engaging pawl abuts and engages with the abutment surface of the abutting engagement strip portion.

[0042]

According to the fourth aspect described above, the general-purpose Phillips-head screwdriver can be used to disengage the engagement. With this configuration, it is possible to further improve the workability.

[0043]

According to a fifth aspect of the present technology, in any one of the second to fourth aspects described above,

the recessed groove extends from the engagement surface to a predetermined position located before the distal end of the engaging pawl, and

the engaging pawl has a standing wall portion between the distal end thereof and a distal end of the recessed portion.

[0044]

According to the fifth aspect described above, the work tool is less likely to come out of the recessed groove by the standing wall portion, when the tip of the work tool is inserted into the recessed groove. With this configuration, during the engagement is disengaged, it is possible to further prevent from displacing and rotating the work tool.

[0045]

According to a sixth aspect of the present technology, the case of any one of the second to fifth aspects described above, further comprising an accommodated component is housed between the first member and the second member, wherein

the case and the accommodated component or the case and a peripheral component at a periphery of the case are connected to each other by a fastening member equipped with a cross-shaped groove, and

a width of the through groove or a width of the recessed groove is larger than or equal to a width of a wing of the cross-shaped groove of the fastening member.

[0046]

According to the sixth aspect described above, during the engagement is disengaged, the work tool which is the same as one used for attachment and detachment of the fastening member equipped with the cross-shaped groove can be used. With this configuration, since there is no need to change the work tool, it is possible to further improve the workability.

[0047]

According to a seventh aspect of the present technology, in any one of the first to sixth aspects described above,

at least one of the first member and the second member is attached to a glass plate.

[0048]

According to the seventh aspect described above, it is possible to disengage the engagement while damage on the glass plate is avoided.

[0049]

According to an eighth aspect of the present technology, there is provided a heating cooker having the case of any one of the first to seventh aspects described above.

[0050]

According to the eighth aspect described above, the heating cooker excellent in workability can be provided.

INDUSTRIAL APPLICABILITY

[0051]

According to the present invention, a case excellent in workability during disengagement can be provided.

CLAIMS

1. A case comprising a first member and a second member connected to each other, wherein

5 the first member has an engaged portion having an engagement hole, and

 the second member has an engaging portion that is inserted into the engagement hole, wherein

 the engaging portion has an engaging pawl that protrudes outward
10 from the engagement hole and engages with the engaged portion, when the engaging portion is inserted into the engagement hole,

 the engaged portion has an abutting engagement strip portion that extends along an insertion direction of the engaging portion from an abutment surface at a periphery of the engagement hole with which the
15 engaging pawl abuts and engages, and

 the abutting engagement strip portion has a through groove that extends along the insertion direction of the engaging portion from the abutment surface and penetrates through an outer side surface of the abutting engagement strip portion.

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2. The case according to claim 1, wherein

 the engaging pawl has a recessed groove that extends toward a distal end of the engaging pawl from an engagement surface of the engaging pawl,

the engagement surface abuts and engages with the abutment surface, and

the through groove of the abutting engagement strip portion and the recessed groove of the engaging pawl are formed such that those grooves are in communication with one another in the insertion direction of the engaging portion, when the engagement surface of the engaging pawl abuts and engages with the abutment surface of the abutting engagement strip portion.

10 3. The case according to claim 2, wherein

the engaging pawl has a flat surface that has a uniform thickness and extends from the engagement surface of the engaging pawl toward the distal end of the engaging pawl.

15 4. The case according to claim 3, wherein

the flat surface is formed so as to be aligned orthogonal to the through groove of the abutting engagement strip portion and the recessed groove of the engaging pawl, when the engagement surface of the engaging pawl abuts and engages with the abutment surface of the abutting engagement strip portion.

20 5. The case according to any one of claims 2 to 4, wherein

the recessed groove extends from the engagement surface to a predetermined position located before the distal end of the engaging pawl, and

the engaging pawl has a standing wall portion between the distal end thereof and a distal end of the recessed portion.

6. The case according to any one of claims 2 to 4, further comprising

an accommodated component is housed between the first member and the second member, wherein

the case and the accommodated component or the case and a peripheral component at a periphery of the case are connected to each other by a fastening member equipped with a cross-shaped groove, and a width of the through groove or a width of the recessed groove is larger than or equal to a width of a wing of the cross-shaped groove of the fastening member.

7. The case according to any one of claims 1 to 4, wherein at least one of the first member and the second member is attached to a glass plate.

8. A heating cooker having the case according to any one of claims 1 to 7.