[0011]

The cleaning tool 10 of the present embodiment includes: the cleaning tool body 11 including a cleaning head section 12 and the base body 13 that is attached the cleaning head section 12 so as to cover a lower surface, which is a first surface, of the cleaning head section 12; and a handle section 20 that is attached to an upper surface, which is a second surface that is opposite to the first surface, of the cleaning head section 12 via a joint section 40. The cleaning tool 10 is configured such that a cleaning sheet 30 (see Fig. 6(a)) is attached covering the cleaning surface 14 constituted by a lower surface, which is a first surface, of the base body 13. The cleaning tool 10 has a compact shape, compared with a conventional cleaning tool suitable for an operation for cleaning a floor surface of a living room or the like, and is thereby suitable for wiping a floor surface of a toilet room for example, which is a cleaning target, with the cleaning sheet 30. As shown also in Figs. 2 and 3, in a plan view, the cleaning head section 12 and the base body 13 of the cleaning tool body 11 each have a planar shape with a pair of short sides 12a/13a and a pair of long sides 12b/13b at both ends of the pair of short sides 12a/13a. As shown in Fig. 6(a), the cleaning sheet 30 that covers the cleaning surface 14 constituted by the lower surface, which is the first surface, of the base body 13 is attached to the cleaning tool body 11 by the cleaning sheet 30 being folded back at the short sides 13a of the base body 13, and end portions thereof being respectively attached to a pair of attached sections 50 that are provided in end sections at both ends, with respect to the long side direction, of the cleaning head section 12. As shown in Figs. 2 and 9(a) and 9(b), each of the attached sections 50 includes: an openable sandwiching lid piece 54 that is arranged and superposed on an end section, with respect to the long side direction, of a portion on the upper surface side, which is the second surface side, of the cleaning head section 12; a magnet 52 that is provided on one of the sandwiching lid piece 54 and the end section, with respect to the long side direction, of the portion on the upper surface side, which is the second surface side, of the cleaning head section 12 (in the present embodiment, on the end section, with respect to the long side direction, of the portion on the upper surface side of the cleaning head section 12); and a magnetic material 53 that is provided on the other of the sandwiching lid piece 54 and the above-described end section (in the present embodiment, on the sandwiching lid

piece 54) and that can be magnetically attracted to the magnet 52. The end portion of the cleaning sheet 30 that is folded back at a corresponding short side 13a of the base body 13 can be sandwiched and detachably attached between a corresponding end section, with respect to the long side direction, of the base body 13 and the sandwiching lid piece 54 due to the magnetic force between the magnet 52 and the magnetic material 53 (see Fig. 6(a)).

[0012]

Moreover, in the present embodiment, preferably, the sandwiching lid piece 54 is arranged and superposed on the end section, with respect to the long side direction, of the portion on the upper surface side, which is the second surface side, of the cleaning head section 12 in such a manner that the sandwiching lid piece 54 is openable by rotating about a rotating shaft 54a (see Fig. 9(b)) that is located spaced apart from a corresponding short side of the cleaning head section 12 and extends in the short side direction.

[0013]

Furthermore, in the present embodiment, the magnet 52 and the magnetic material 53 are individually attached to a back surface side of a plate that forms the upper surface, which is the second surface, of the cleaning head section 12 or a plate that forms a lower surface, which is a first surface, of the sandwiching lid piece 54 in a state in which the magnet 52 and the magnetic material 53 are covered by the respective plates.

[0014]

Here, in this specification, a direction along the short sides 12a of the cleaning head section 12 is referred to as “short side direction” or “left-right direction” (“direction X”), and a direction along the long sides 12b is referred to as “long side direction” or “front-rear direction” (“direction Y”) (see Fig. 2).

[0015]

In the present embodiment, as shown in Figs. 1 to 3, the cleaning head section 12

constituting the cleaning tool body 11 of the cleaning tool 10 is a flat plate-like plastic member that is made of, for example, an ABS resin (acrylonitrile butadiene styrene) or the like and that has a substantially rectangular planar shape of a size with, for example, a maximum length in the short side direction (direction X) of about 50 to 90 mm (in the present embodiment, 75 mm) and a maximum length in the long side direction (direction Y) of about 120 to 160 mm (in the present embodiment, 140 mm). Thus, the cleaning head section 12 has a compact shape when compared with a conventional cleaning tool mainly suitable for an operation for cleaning a floor surface or the like of a living room. The pair of long sides 12b of the cleaning head section 12 each have a constriction portion 12c that is curved inward, with a radius of curvature of about 200 to 300 mm, toward the center to which the handle section 20 is connected. Moreover, an annular peripheral wall rib 16 protrudes from a peripheral edge of the cleaning head section 12 toward the lower surface side thereof to a height of about 3 to 10 mm, for example, and extends continuously in a circumferential direction. In each of the short sides 12a, an outer peripheral surface of a corner of the annular peripheral wall rib 16 is formed in a circular arc shape. Thus, the likelihood of the cleaning sheet 30 to be attached being damaged when folded back at the short sides 12a can be effectively avoided.

[0016]

Moreover, as shown in Fig. 4, a reinforcement rib 17 is provided on the lower surface side of the cleaning head section 12, in a central portion of a region enclosed by the annular peripheral wall rib 16. The reinforcement rib 17 is provided in order to increase the rigidity against a pressing force applied from the handle section 20 that is attached to a central portion on the upper surface side of the cleaning head section 12. The reinforcement rib 17 forms a three-dimensional pattern with a predetermined shape, extends over a region with an appropriate area in the central portion, and protrudes to a height that does not exceed a lower end of the annular peripheral wall rib 16. Joining ribs 18a are provided on the respective short sides 12a at both ends, with respect to the long side direction (direction Y), of the region enclosed by the annular peripheral wall rib 16. The joining ribs 18a are arranged close to the annular peripheral wall rib 16, extend in the short

side direction (direction X), and protrude to a height that does not exceed the lower end of the annular peripheral wall rib 16. The short sides 13a of the base body 13 are joined to the short sides 12a of the cleaning head section 12 via the joining ribs 18a.

[0017]

Furthermore, circular projections 18b are arranged on the lower surface side of the cleaning head section 12. The circular projections 18b adjoin the central portion side, on which the reinforcement rib 17 is provided, of the respective joining ribs 18a, and are formed as a result of circular inserted recesses 51 (see Fig. 9(a)), which will be described later, being formed on the upper surface side of the cleaning head section 12. Locking ribs 18c for locking the magnets 52 constituting the attached sections 50, which will be described later, are provided on the lower surface side of the circular projections 18b. The locking ribs 18c are discontinuously arranged concentrically with the respective circular projections 16b and protrude to a height that does not exceed the lower end of the annular peripheral wall rib 16. Moreover, connection openings 18d having a rectangular shape that is wider than long are formed adjoining the central portion side, on which the reinforcement rib 17 is formed, of the respective circular projections 18b. The connection openings 18d are provided in order to rotatably pin-connect the sandwiching lid pieces 54 constituting the attached sections 50, which will be described later, and extend in the short side direction (direction X). Shaft-supporting ribs 18e protrude from both end portions, with respect to the short side direction (direction X), of each connection opening 18d. Circular arc-shaped auxiliary reinforcement ribs 18f are provided protruding on both sides, with respect to the short side direction (direction X), of each circular projection 18c.

[0018]

As shown in Fig. 2, a preferably bifurcated, head-side yoke portion 19 that forms the joint section 40 between the cleaning tool body 11 and the handle section 20 is provided in the central portion on the upper surface side of the cleaning head section 12 and has a raised central portion. Moreover, the sandwiching lid pieces 54 constituting the attached sections 50, which will be described later, are openably attached to portions on both sides,

with respect to the long side direction (direction Y), of the head-side yoke portion 19. The sandwiching lid pieces 54 are superposed on the respective end sections, with respect to the long side direction (direction Y), of the upper surface of the cleaning head section 12.

[0019]

As shown in Figs. 1 to 3, the base body 13, which constitutes the cleaning tool body 11 of the cleaning tool 10 together with the cleaning head section 12, is a deformable thin plate-like member that is made of, for example, an elastomer with a hardness of about 90 (as measured using a type A (Shore A) durometer specified in JIS K 6253) and that has a substantially rectangular planar shape of a size that is larger than the cleaning head section 12, with, for example, a maximum length in the short side direction (direction X) of about 60 to 100 mm (in the present embodiment, 82 mm) and a maximum length in the long side direction (direction Y) of about 130 to 170 mm (in the present embodiment, 152 mm) and preferably has a thickness of about 0.5 to 3.0 mm. Thus, when the base body 13 is integrally joined to the cleaning head section 12, a peripheral edge section of the base body 13 protrudes outward from the peripheral edge of the cleaning head section 12 while continuously extending in the circumferential direction, and constitutes a flexibly deformable annular protruding piece 15 that protrudes with a protruding width of preferably 2 to 20 mm. The base body 13 may also be provided with edge constriction portions 13e in edge portions of the annular protruding piece 15 that protrude outward from the respective long sides 12b of the cleaning head section 12, the edge constriction portions 13e being curved inward with a radius of curvature that is preferably larger than the radius of curvature of the constriction portions 12c of the long sides 12b of the cleaning head section 12 and is, for example, about 300 to 500 mm (see Fig. 5).

[0020]

Moreover, the base body 13 is molded into a thin plate-like shape, with its cross section taken along the long side direction (direction Y), which is a longitudinal direction of the base body 13, being curved into an arc shape with a radius of curvature of preferably about 300 to 600 mm (see Fig. 3). Thus, the base body 13 is configured such that, when

integrally joined to the cleaning head section 12, the base body 13 is attached in a state of protruding in a curved shape from the lower surface of the cleaning head section 12 and is elastically deformable so that it can be flattened by a pressing force applied to the cleaning head section 12 via the handle section 20 during the wiping operation. It is preferable that the base body 13 keeps the curved shape before it is joined to the cleaning head section 12.

[0021]

Furthermore, in the present embodiment, as shown in Figs. 2 and 3, base-side joining ribs 13c are provided on the two short sides 13a on the upper surface side, which is the second surface side, of the base body 13. The base-side joining ribs 13c are provided at positions corresponding to the respective joining ribs 18a being formed and protruding from the lower surface side of the cleaning head section 12, protrude upright, and extend in the short side direction (direction X). Moreover, a pair of plate-like ribs 13d are provided on the two long sides 13b on the upper surface side of the base body 13 so as to connect the two end portions of one of the pair of base-side joining ribs 13c to the two end portions of the other base-side joining rib 13c. The plate-like ribs 13d are provided protruding upright at positions corresponding to respective portions of the annular peripheral wall rib 16 that are located on the pair of long sides 12b including the constriction portions 12c, of the cleaning head section 12, and form an annular continuous rib together with the base-side joining ribs 13c.

[0022]

The base body 13 can be integrally joined to the cleaning head section 12 by joining the pair of base-side joining ribs 13c on the two short sides 13a of the base body 13 to the pair of joining ribs 18a, respectively, which are provided on the lower surface side of the two short sides 12a of the cleaning head section 12, from an outer side via, for example, an adhesive. The base-side joining ribs 13c can also be joined to the joining ribs 18a using other joining methods, such as fitting, sandwiching, and ultrasonic sealing. As a result of the pair of base-side joining ribs 13c being respectively joined to the pair of joining ribs 18a on the two short sides 12a of the cleaning head section 12, the pair of plate-like ribs

13d on the two long sides 13b of the base body 13 can be arranged so as to be vertically slidable along inner side surfaces of the respective portions of the annular peripheral wall rib 16 that are located on the pair of long sides 12b of the cleaning head section 12. Since the base body is provided with the pair of plate-like ribs 13d that are slidable along the inner side surfaces of the long side portions of the annular peripheral wall rib 16 of the cleaning head section 12, it is possible to close gaps between the long side portions of the annular peripheral wall rib 16 of the cleaning head section 12 and the long sides of the base body 13 that are curved in the long side direction (direction Y), and thereby effectively avoid the intrusion of dust, debris, and the like to the inside of the cleaning head section 12.

[0023]

Moreover, with this configuration, a pressing force applied to the cleaning head section 12 via the handle section 20 during the wiping operation can cause the base body 13 to be elastically deformed and flattened from the state in which it protrudes in the curved shape from the lower surface of the cleaning head section 12, while sliding the pair of plate-like ribs 13d along the annular peripheral wall rib 16 at the long sides 12b of the cleaning head section 12.

[0024]

Furthermore, in the present embodiment, as shown in Fig. 5, preferably, a plurality of planarly projecting ribs 14a are provided on the lower surface, which is the first surface, of the base body 13 that forms the cleaning surface 14, and the planarly projecting ribs 14a are dispersedly arranged over the entire lower surface and protrude therefrom. The planarly projecting ribs 14a are three-dimensional ribs with a preferably flat surface at the distal end. The planarly projecting ribs 14a protrude from the lower surface of the base body 13 to a height of preferably 0.5 to 5 mm, and more preferably 1 to 3 mm. As a result of the plurality of planarly projecting ribs 14a being dispersedly arranged over the entire lower surface of the base body 13, when, for example, the cleaning tool body 11 is slid over a floor surface, which is a cleaning target, with the cleaning sheet 30 sandwiched between the floor surface and the lower surface, which is the cleaning surface 14, of the base body

13, a plurality of surfaces formed on the cleaning sheet 30 by the finely dispersed planarly projecting ribs 14a can be pressed against the floor surface, making it possible to effectively avoid problems, such as the cleaning sheet 30 slipping and being displaced relative to the cleaning surface 14, or the cleaning sheet 30 easily tearing and a hole easily forming especially in the case where the cleaning sheet 30 is a water-disintegrable sheet.

[0025]

Moreover, it is preferable that, in a plan view, the planarly projecting ribs 14a have a triangular planar shape. In the present embodiment, the planarly projecting ribs 14a have an equilateral triangular planar shape. The triangular planar shape makes it possible to perform cleaning without causing the cleaning sheet 30 to slip and become displaced relative to the cleaning surface 14, even when wiping the cleaning target by moving the cleaning tool body 11 not only in the long side direction (direction Y) but also in the short side direction (direction X). It is preferable that the planarly projecting ribs 14a having an equilateral triangular planar shape are provided in a radial arrangement in which the base sides of six of the planarly projecting ribs 14a are located at positions corresponding to the six sides, respectively, of an imaginary hexagon. This configuration effectively prevents the cleaning sheet 30 from being displaced relative to the cleaning surface 14 even when a complex movement of the cleaning tool body 11 is performed in which the cleaning tool body 11 is moved both in the long side direction (direction Y) and in the short side direction (direction X), thereby enabling reliable cleaning.

[0026]

In the present embodiment, as shown in Fig. 1, the handle section 20, which constitutes the cleaning tool 10 together with the cleaning tool body 11, includes an elongated rod-shaped handle body 21 and a holding portion 22 that is integrally connected and fixed to an upper portion of the handle body 21.

[0027]

The handle body 21 is assembled by, for example, connecting pipe members 21a made of an aluminum alloy, an ABS resin, or the like to each other in an axial direction, via a known connecting portion 23 as necessary, so that the entire handle section 20 including the holding portion 22 has a length of, for example, about 50 to 70 cm that is suitable for cleaning a small space such as a toilet room. A bifurcated handle-side yoke portion 24 preferably composed of a pair of yoke pieces 24a, is integrally provided at a lower end portion of the handle body 21 (handle section 20). The holding portion 22 is detachably attached to an upper end portion of the handle body 21 via a known connecting portion 23a having substantially the same structure as the connecting portion 23 of the pipe members 21a. The handle section 20 is rotatably attached to the central portion on the upper surface side of the cleaning head section 12 by the joint section 40 via a rotating joint member 41, which will be described later.

[0028]

The holding portion 22 is a molded product made of an ABS resin, for example, and has a substantially cylindrical shape with a thickness and an outer shape that can be easily held by hand. An end cap 25 is mounted to an upper end portion of the holding portion 22, the end cap 25 being a transparent or translucent elastic member made of a relatively soft elastic material with a rubber hardness of 40 to 80 (as measured using a type A (Shore A) durometer specified in JIS K 6253), and preferably an ethylene-vinyl acetate (EVA) resin. Thus, the stability when, for example, the handle section 20 is placed against a wall can be improved, and the handleability of the cleaning tool 10 when cleaning is performed by holding the handle section 22 can also be improved.

[0029]

As described above, the joint section 40, which rotatably connects the cleaning head section 12 and the handle section 20, connects the head-side yoke portion 19 that protrudes from the upper surface, which is the second surface, of the cleaning head section 12 and the handle-side yoke portion 24 that is provided at a distal section of the handle section 20 to each other via the rotating joint member 41, thereby enabling the handle

section 20 to be connected to the cleaning head section 12 so as to be rotatable in the front-rear direction Y and the left-right direction X (see Figs. 7(a) and 7(b)). The rotating joint member 41 includes a first rotational axial center portion 41a whose central axis C1 (see Fig. 8) is oriented in the short side direction (direction X) and a second rotational axial center portion 41b whose central axis C2 (see Fig. 8) is oriented in the long side direction (direction Y), and the central axis C1 and the central axis C2 are perpendicular to each other. In the joint section 40, the sliding resistance during rotation about the second rotational axial center portion 41b is greater than the sliding resistance during rotation about the first rotational axial center portion 41a.

[0030]

Moreover, in the present embodiment, as shown in Figs. 2, 7(a) to 7(c), and 8, the head-side yoke portion 19 is preferably a bifurcated yoke portion with a pair of yoke protrusions 19a, and the handle-side yoke portion 24 is preferably a bifurcated yoke portion with the pair of yoke pieces 24a. As a result of the head-side yoke portion 19 being a bifurcated yoke portion with the pair of yoke protrusions 19a and the handle-side yoke portion 24 being a bifurcated yoke portion with the pair of yoke pieces 24a, it is possible to individually control the sliding friction when tilting the handle section 20 in the short side direction (direction X) and the sliding friction when tilting the handle section 20 in the long side direction (direction Y) and to shift the positions of the rotational axial center portions 41a and 41b. Furthermore, in the present embodiment, a height h1 (see Fig. 7(b)) from the lower surface of the cleaning head section 12 to the central axis C1 of the first rotational axial center portion 41a, which is the closer to the lower surface, of the rotating joint member 41 is preferably 10 to 20 mm, and more preferably 14 to 18 mm (in the present embodiment, 16 mm).

[0031]

In the present embodiment, the head-side yoke portion 19 has a shape in which a central portion of a mound-shaped raised portion that is raised from the central portion of the upper surface of the cleaning head section 12 is cut out with a cut-out width of, for

example, about 10 to 30 mm. As a result, the head-side yoke portion 19 has the pair of symmetrically shaped yoke protrusions 19a that are spaced apart from each other, with respective cut surfaces 19b that are substantially perpendicular to the lower surface of the cleaning head section 12 opposing each other. As shown in Fig. 8, an engagement hole 19c with which the first rotational axial center portion 41a of the rotating joint member 41 engages is formed in the cut surface 19b of each yoke protrusion 19a. A portion between the engagement hole 19c and a distal edge of the cut surface 19b is diagonally cut out to form a guiding tapered surface 19d for facilitating the operation of forcibly pushing the rotating joint member 41 and thereby engaging the first rotational axial center portion 41a with the engagement hole 19c.

[0032]

Moreover, in the present embodiment, a sliding friction surface portion 19e having a circular arc-shaped inwardly curved surface is provided on a bottom surface portion of a gap portion between the pair of yoke protrusions 19a, which are spaced apart from each other. When the rotating joint member 41 is fitted between the pair of yoke protrusions 19a, the first rotational axial center portion 41a having a cylindrical shape, of the rotating joint member 41 comes into surface contact with the sliding friction surface portion 19e, and thus, as the rotating joint member 41 rotates about the central axis C1, sliding resistance due to a frictional force is generated. The sliding resistance between the sliding friction surface portion 19e and the first rotational axial center portion 41a can be easily regulated by adjusting the contact area and clearance therebetween by, for example, providing a predetermined number of projecting ribs 19f with a predetermined width on the sliding friction surface portion 19e.

[0033]

In the present embodiment, the handle-side yoke portion 24 is formed into a bifurcated shape composed of the pair of strip-shaped yoke pieces 24a, by forming a through groove 24b with an appropriate width in the lower end portion of the handle section 20, the through groove 24b being formed in the axial direction from the distal end of the

handle section 20 toward the holding portion 22. The pair of yoke pieces 24a, with their distal edges formed in a circular arc shape and their outer circumferential surfaces formed as gently outwardly curved surfaces, are arranged on both sides across the through groove 24b.

[0034]

Moreover, in the present embodiment, insertion fixing holes 24c to which a rotating pin member 25 that traverses the through groove 24b is attached are formed in the pair of yoke pieces 24a, respectively. A head mounting recess 24d into which a head 25b of the rotating pin member 25 is fitted is formed on an outer surface side of one of the yoke pieces 24a.

[0035]

The rotating pin member 25 includes a cylindrical pin body 25a that traverses the through groove 24b and is fixed to the insertion fixing holes 24c of the pair of yoke pieces 24a at two end portions thereof, and the head 25b that is integrally provided at one of the end portions of the pin body 25a. Also, a pin-side sliding sleeve 25c for increasing the frictional force between the pin body 25a and a circular axial opening 41e of the second rotational axial center portion 41b of the rotating joint member 41 is integrally mounted to the pin body 25a. With the rotating pin member 25a, it is possible to rotatably connect the lower end portion of the handle section 20 to the rotating joint member 41 by inserting the second rotational axial center portion 41b of the rotating joint member 41 into the through groove 24b between the pair of yoke pieces 24a, inserting the pin body 25a of the rotating pin member 25 into the insertion fixing holes 24c of the yoke pieces 24a and the circular axial opening 41e of the second rotational axial center portion 41b, with the center of the circular axial opening 41e and the center of the insertion fixing holes 24c aligned, and fixing the two end portions of the pin body 25a.

[0036]

In the present embodiment, the rotating joint member 41 that is interposed between the head-side yoke portion 19 and the handle-side yoke portion 24 is, for example, a molded plastic product and, as shown in Figs. 7(a) to 7(c) and 8, includes the first rotational axial center portion 41a and the second rotational axial center portion 41b whose central axes C1 and C2 are perpendicular to each other in the form of a grade separation. The first rotational axial center portion 41a of the rotating joint member 41 has a cylindrical shape and is provided with engagement protrusions 41c protruding from both end surfaces thereof. The engagement protrusions 41c each have a cylindrical shape that is arranged concentrically with the first rotational axial center portion 41a, and a central axis thereof coincides with the central axis C1 of the first rotational axial center portion 41a.

[0037]

When the first rotational axial center portion 41a of the rotating joint member 41 is forcibly pushed into and thereby fitted to the gap portion between the pair of yoke protrusions 19a of the head-side yoke portion 19, the engagement protrusions 41c are rotatably engaged with the engagement holes 19c formed in the cut surfaces 19b of the two respective yoke protrusions 19a. As a result, the outer circumferential surface of the first rotational axial center portion 41a is in surface contact with the sliding friction surface portion 19e provided on the bottom surface portion between the pair of yoke protrusions 19a. Moreover, a portion of the lower half of each engagement protrusion 41c that is located on the side opposite to the side from which the second rotational axial center portion 41b protrudes is diagonally cut out to form a sliding tapered surface 41d. The operation of forcibly pushing the rotating joint member 41 and engaging the first rotational axial center portion 41a with the engagement holes 19c can be performed more smoothly, by pushing the rotating joint member 41, which is attached to the lower end portion of the handle section 20, for example, into the gap portion between the pair of yoke protrusions 19a of the head-side yoke portion 19 while superposing the sliding tapered surfaces 41d on the respective guiding tapered surfaces 19d formed at the cut surfaces 19b of the yoke protrusions 19a.

[0038]

The second rotational axial center portion 41b of the rotating joint member 41 is, for example, a thick plate-like portion having a semi-oval shape in a front view and protruding outward from the outer circumferential surface of the first rotational axial center portion 41a. The circular axial opening 41e, which is to be aligned with the insertion fixing holes 24c formed in the yoke pieces 24a of the handle-side yoke portion 24 and through which the pin body 25a of the rotating pin member 25 is to be passed, is formed in the center of the second rotational axial center portion 41b. An opening-side sliding sleeve 41f is attached covering an inner circumferential surface of the circular axial opening 41e. The opening-side sliding sleeve 41f comes into surface contact with an outer circumferential surface of the pin-side sliding sleeve 25c mounted to the inserted pin body 25a of the rotating pin member 25, and the frictional force with the rotating pin member 25 can thus be increased. The central axis of the circular axial opening 41e and the central axis of the rotating pin member 25 inserted therein coincide with the central axis C2 of the second rotational axial center portion 41b.

[0039]

In the present embodiment, for example, the rotating joint member 41 is rotatably attached to the handle-side yoke portion 24 via the rotating pin member 25 in a state in which the second rotational axial center portion 41b is inserted in the through groove 24b between the pair of yoke pieces 24a. After that, the rotating joint member 41 attached to the handle-side yoke portion 24 at the lower end portion of the handle section 20 is forcibly pushed into the gap portion between the pair of yoke protrusions 19a of the head-side yoke portion 19 while superposing the sliding tapered surfaces 41d of the engagement protrusions 41c of the first rotational axial center portion 41a on the respective guiding tapered surfaces 19d of the cut surfaces 19b of the yoke protrusions 19a, and the engagement protrusions 41c are rotatably engaged with the respective engagement holes 19c. Thus, the joint section 40 is formed. As a result, the lower end portion of the handle section 20 is rotatably connected to the central portion of the upper surface of the cleaning head section 12 in a state in which the outer circumferential surface of the first rotational

axial center portion 41a of the rotating joint member 41 is in surface contact with the sliding friction surface portion 19e provided on the bottom surface portion between the pair of yoke protrusions 19a of the cleaning head section 12. Therefore, it is possible to rotate and tilt the handle section 20 in the left-right direction (direction X) and the front-rear direction (direction Y) from a state in which the handle section 20 stands vertically on the cleaning head section 12 of the cleaning tool body 11, and to freely rotate the handle section 20 in the circumferential direction with the rotating joint member 41 as the center of rotation.

[0040]

Moreover, in the present embodiment, in the thus formed joint section 40 between the cleaning head section 12 and the handle section 20, the sliding resistance during rotation about the second rotational axial center portion 41b, which is caused by the surface contact between the opening-side sliding sleeve 41f that covers the inner circumferential surface of the circular axial opening 41e of the second rotational axial center portion 41b and the pin-side sliding sleeve 25c that is mounted to the pin body 25a of the rotating pin member 25, is greater than the sliding resistance during rotation about the first rotational axial center portion 41a, which is caused by the surface contact between the outer circumferential surface of the first rotational axial center portion 41a and the sliding friction surface portion 19e on the bottom surface portion between the yoke protrusions 19a of the cleaning head section 12. As a result, the resistance force against a moment that causes rotation in the left-right direction (short side direction) X about the second rotational axial center portion 41b is increased, and therefore, wobbling of the cleaning tool body 11 in the left-right direction X, and tilting and falling over thereof, during the operation are avoided, and the handling stability can thus be improved. In view of this, the sliding resistance during rotation about the second rotational axial center portion 41b is preferably 1.2 times or more, or more preferably 1.5 times or more, and preferably 10 times or less, greater than the sliding resistance during rotation about the first rotational axial center portion 41a.

[0041]

Here, the sliding resistance during rotation in the left-right direction (short side

direction) X about the second rotational axial center portion 41b is the peak load measured using a pull-push gauge when the handle section 20 standing vertically on the cleaning head section 12 is tilted to an angle of about 45° from the vertical by pushing a position of the handle section 20 that is located 50 mm above the central axis C2 of the second rotational axial center portion 41b. The sliding resistance during rotation in the left-right direction (short side direction) X about the second rotational axial center portion 41b is preferably 0.8 to 2.0 N. The sliding resistance during rotation in the front-rear direction (long side direction) Y about the first rotational axial center portion 41a is the peak load measured using a pull-push gauge when the handle section 20 standing vertically on the cleaning head section 12 is tilted to an angle of about 45° from the vertical by pushing a position of the handle section 20 that is located 50 mm above the central axis C1 of the first rotational axial center portion 41a. The sliding resistance during rotation about the first rotational axial center portion 41a is preferably 0.2 to 1.2 N.

[0042]

The sliding resistance during rotation about the second rotational axial center portion 41b and the sliding resistance during rotation about the first rotational axial center portion 41a can be easily set, for example, by adjusting the material and the thickness (including diameter) of the opening-side sliding sleeve 41f and the pin-side sliding sleeve 25c, and by adjusting the material and the surface contact area of the outer circumferential surface of the first rotational axial center portion 41a and the sliding friction surface portion 19e.

[0043]

In the present embodiment, the cleaning tool 10 is used for a cleaning operation, with a disposable cleaning sheet 30 detachably and replaceably attached, covering the cleaning surface 14 constituted by the lower surface of the base body 13 of the cleaning tool body 11. As shown in Fig. 6, the cleaning sheet 30 can be attached to the cleaning tool body 11 preferably by the cleaning sheet 30 being folded back at the short sides 12a and 13a of the cleaning head section 12 and the base body 13 and the end portions thereof

being attached to the cleaning head section 12 via the respective attached sections 50. As a result of the cleaning sheet 30 being folded back at the short sides 13a of the base body 13 and its end portions being attached to the cleaning head section 12, it is possible to even better collect dust and dirt from the short sides 12a and 13a onto the cleaning sheet 30 when cleaning a small region.

[0044]

The cleaning sheet 30 is a sheet suitable for being attached, covering the cleaning surface 14 constituted by the lower surface of the base body 13 of the cleaning tool body 11, and holding onto dust, dirt, and the like, and, for example, various known cleaning sheets, such as an olefin-based ultrafine fiber nonwoven fabric, can be used as such sheet. Moreover, in the case where the cleaning sheet 30 is used for cleaning of the floor surface or the like of a toilet room, it is preferable that the cleaning sheet 30 is a water-disintegrable sheet that can be flushed down the toilet bowl after wiping the floor surface or the like.

[0045]

In the present embodiment, as shown in Figs. 2, 6(a), and 9(a) and 9(b), each of the attached sections 50, by means of which the cleaning sheet 30 is attached to the cleaning head section 12 and hence to the cleaning tool body 11, includes: the sandwiching lid piece 54 that is arranged so as to be superposed on a corresponding, preferably sunken, end section, with respect to the long side direction (direction Y), of a portion on the upper surface side, which is the second surface side, of the cleaning head section 12; the magnet 52 that is provided on one of the end section, with respect to the long side direction, of the cleaning head section 12 and the sandwiching lid piece 54 (in the present embodiment, on the end section, with respect to the long side direction, of the cleaning head section 12); and the magnetic material 53 that is provided on the other of the end section of the cleaning head section 12 and the sandwiching lid piece 54 (in the present embodiment, on the sandwiching lid piece 54) and that can be magnetically attracted to the magnet 52. The end portions of the cleaning sheet 30 that are folded back at the respective short sides 12a and 13a of the cleaning head section 12 and the base body 13 are sandwiched and thereby

attached between upper surfaces of the corresponding, preferably sunken, end sections, with respect to the long side direction, of the cleaning head section 12 and lower surfaces of the corresponding sandwiching lid pieces 54, and the cleaning sheet 30 can thus be detachably attached to the cleaning tool body 11 with ease (see Fig. 6(a)). Moreover, the magnetic force between the magnets 52 and the respective magnetic materials 53 enables attachment through more reliable sandwiching between the upper surfaces of the end sections of the cleaning head section 12 and the lower surfaces of the sandwiching lid pieces 54, and also enables a smoother opening/closing operation of the lid pieces 54.

[0046]

Moreover, in the present embodiment, each sandwiching lid piece 54 is rotatably attached to the cleaning head section 12 by, for example, connecting, preferably pin-connecting, a flange-like rotating base 54b (see Figs. 9(a) and 9(b)) to the rotating shaft 54a (see Fig. 9(b)), the rotating shaft 54a extending in the short side direction (direction X) and being fixed with its both end portions supported by the shaft-supporting ribs 18e that are provided on opposite sides of a corresponding one of the connection openings 18d (see Figs. 3 and 4) formed in the cleaning head section 12, and the flange-like rotating base 54b being formed to be insertable into the connection opening 18d. That is to say, each sandwiching lid piece 54 can be rotated about the rotating shaft 54a that is located spaced apart from a corresponding short side 12a of the cleaning head section 12 and extends in the short side direction. This also allows the sandwiching lid piece 54 to be openably arranged and superposed on the respective end section, with respect to the long side direction (direction Y), of the portion on the upper surface side of the cleaning head section 12.

[0047]

Furthermore, in the present embodiment, as shown in Fig. 9(b), each magnet 52 constituting the respective attached section 50 is attached to the lower surface of a portion that protrudes downward as the circular projection 18b (see Fig. 4) on a lower surface (back surface) side of the circular inserted recess 51 (see Fig. 9(a)) that is formed on the upper surface side of the cleaning head section 12, and the magnet 52 is attached by being locked

by the locking ribs 18c, which are discontinuously arranged concentrically with the circular projection 18b. Also, as a result, the magnet 52 is attached to a back surface side of the plate of a portion of the inserted recess 51 forming the upper surface of the cleaning head section 12, in a state in which the magnet 52 is covered by that plate.

[0048]

As shown in Fig. 9(b), each magnetic material 53 constituting the respective attached section 50 is accommodated in an inner region of a corresponding circular inserting projection 54c that is provided on the lower surface side of the sandwiching lid piece 54, corresponding to the position of the inserted recess 51 (see Fig. 9(a)) formed on the upper surface side of the cleaning head section 12, and is attached in a state in which the magnetic material 53 is covered by a cover cap 54d that is externally locked to the inserted recess 54c. Also, as a result, the magnetic material 53 is attached to a back surface side of a plate of a portion of the cover cap 54d forming the lower surface of the sandwiching lid piece 54, in a state in which the magnetic material 53 is covered by that plate.

[0049]

Here, a “magnetic material” is a material that can be magnetized, and means one that can be attracted to a magnet. The magnetic material is preferably a material made of a ferromagnetic material that is strongly magnetized in the same direction when a magnet is brought close to it, such as iron, nickel, cobalt, and other metals, or may also be a magnet itself.

[0050]

In the present embodiment, the cleaning sheet 30 preferably has a rectangular shape with a width greater than the length of the base body 13, which constitutes the cleaning tool body 11, in the short side direction (direction X) and a length greater than the length of the base body 13 in the long side direction (direction Y). The cleaning

sheet 30 is placed on the lower surface side of the base body 13 with its length direction oriented in the long side direction (direction Y) of the base body 13, and, in a state in which the sandwiching lid pieces 54 are open as shown in Fig. 9(a), the end portions of the cleaning sheet 30 that protrude outward in the long side direction (direction Y) from the respective short sides 13a of the base body 13 are folded back preferably at the short sides 12a and 13a of the cleaning head section 12 and the base body 13. Moreover, the end portions of the cleaning sheet 30 folded back at the short sides 12a and 13a are laid on top of the sunken end sections, respectively, of the upper surface of the cleaning head section 12, and then, the sandwiching lid pieces 54 in the open state are closed, as shown in Fig. 9(b), in such a manner that the sandwiching lid pieces 54 are superposed on the respective sunken end sections of the upper surface of the cleaning head section 12 on top of which the respective end portions of the cleaning sheet 30 are laid. As a result, the sandwiching lid pieces 54, or preferably upper surfaces thereof, are flush with the upper surface of the central portion of the cleaning head section 12, and the end portions of the cleaning sheet 30 can be easily sandwiched between the sunken upper surfaces of the respective end sections of the cleaning head section 12 and the lower surfaces of the respective sandwiching lid pieces 54, due to the magnetic force between the magnets 52 and the respective magnetic materials 53. In addition, the sandwiched state of the end portions of the cleaning sheet 30 can be securely maintained.

[0051]

That is to say, according to the present embodiment, it is possible to detachably attach the cleaning sheet 30 to the cleaning tool body 11 easily and stably by performing a simple operation of merely folding back the both end portions of the cleaning sheet 30, which is placed covering the cleaning surface 14 constituted by the lower surface of the base body 13, at the short sides 12a and 13a of the cleaning head section 12 and the base body 13, and sandwiching the folded-back end portions between the upper surfaces of the two respective end sections of the cleaning head section 12 and the lower surfaces of the two respective sandwiching lid pieces 54 by taking advantage of the magnetic force between the magnets 52 and the respective magnetic materials 53. In particular, in the case where the cleaning sheet 30 is a water-disintegrable sheet, it is possible to attach the

cleaning sheet 30 in a state in which large areas of the end portions of the cleaning sheet 30 are sandwiched between the upper surfaces of the respective end sections of the cleaning head section 12 and the lower surfaces of the respective sandwiching lid pieces 54 so that the end portions of the cleaning sheet 30 can be prevented from tearing, by taking advantage of the magnetic force between the magnets 52 and the respective magnetic materials 53.

[0052]

Moreover, in the present embodiment, the circular inserted recesses 51, on the back surface side of which the magnets 52 are respectively arranged, are formed in the respective sunken end sections of the upper surface of the base body 13, and the circular inserting projections 54c, where the magnetic materials 53 are arranged on the back surface side of the respective cover caps 54d locked thereto, are formed in portions of the lower surfaces of the respective sandwiching lid pieces 54 that correspond to the inserted recesses 51. As a result, when the sandwiching lid pieces 54 are closed, and the end portions of the cleaning sheet 30 are thereby sandwiched between the sandwiching lid pieces 54 and the respective sunken end sections of the upper surface of the cleaning head section 12, the end portions of the cleaning sheet 30 are drawn in and sandwiched between bottom surface portions of the further-sunken inserted recesses 51 and lower end surfaces of the respective cover caps 54d locked to the inserting projections 54c, in the regions of the inserted recesses 51 and the inserting projections 54c to which the cover caps 54d are locked. Also, as a result, displacement of the end portions of the cleaning sheet 30 between the upper surfaces of the respective end sections of the base body 13 and the lower surfaces of the respective sandwiching lid pieces 54, where the end portions of the cleaning sheet 30 are sandwiched, can be effectively avoided, and the cleaning sheet 30 can thus be attached to the cleaning tool body 11 even more stably.

[0053]

In the present embodiment, the magnets 52 and the magnetic materials 53 are arranged on the back surface side of the inserted recesses 51 of the cleaning head section 12 or on the back surface side of the cover caps 54d locked to the inserting projections 54c

of the sandwiching lid pieces 54, covered by the plate forming the upper surface of the cleaning head section 12 or the plates forming the lower surfaces of the sandwiching lid pieces 54, and, in this state, attached to the back surface side of these plates. Therefore, when attaching or detaching the cleaning sheet 30 by opening and closing the sandwiching lid pieces 54, it is possible to effectively avoid a situation in which the magnet 52 or the magnetic material 53 comes off the cleaning head section 12, and, in particular, in the case where the cleaning sheet 30 contains a cleaning chemical or the like, it is possible to effectively avoid a deterioration of the magnets 52 and the magnetic materials 53 due to contact with such chemical or the like.

[0054]

The cleaning sheet 30 that has been attached to the cleaning tool body 11 in the above-described manner is detachably and replaceably attached to the cleaning tool body 11 in a state in which, as shown in Fig. 6(a), preferably side portions, with respect to the width direction, of the cleaning sheet 30 protrude outward from the long sides 12b and 13b of the cleaning head section 12 and the base body 13, and used for a cleaning operation. After being used for the cleaning operation, the cleaning sheet 30 to which sufficient dust and dirt, for example, adhere is released from the state in which its end portions are sandwiched, by, for example, manually rotating the sandwiching lid pieces 54 against the magnetic force and opening them. Thus, the cleaning sheet 30 can be removed from the cleaning tool body 11, preferably without touching it, and disposed of by, for example, directly flushing it down a flush toilet bowl.

[0055]

The cleaning tool 10 of the present embodiment with the above-described configuration enables the cleaning sheet 30 to be detachably attached, with even greater ease, to the cleaning tool body 11 so that the cleaning sheet 30 covers the cleaning surface 14, and makes it easier to perform a cleaning operation with the long side direction (direction Y) as the main cleaning direction, thereby enabling an efficient operation for cleaning a cleaning target, such as a floor surface of a small region, or a region in which a

fixture is installed, such as, for example, a floor surface, a fixture, and the like in a toilet room.

[0056]

That is to say, according to the present embodiment, the cleaning tool 10 preferably has a compact shape, compared with a conventional cleaning tool that is mainly suitable for an operation for cleaning a floor surface or the like of a living room, and, in a plan view, the cleaning head section 12 and the base body 13 of the cleaning tool body 11 have a planar shape having a pair of short sides 12a/13a and a pair of long sides 12b/13b at both ends of the pair of short sides 12a/13a. As shown in Fig. 6(a), the cleaning sheet 30 that covers the cleaning surface 14 constituted by the lower surface, which is the first surface, of the base body 13 is attached to the cleaning tool body 11 in such a manner that: the cleaning sheet 30 is folded back at the short sides 13a of the base body 13; and its end portions are respectively attached to the pair of attached sections 50 that are provided in end sections at both ends, with respect to the long side direction, of the cleaning head section 12. Moreover, the attached sections 50 each include the sandwiching lid piece 54 that is arranged and superposed on a corresponding end section on the upper surface side of the cleaning head section 12, the magnet 52, and