

THIS SHEET HAS BEEN
REPLACED

CLEANER

BACKGROUND OF THE INVENTION

[Field of the Invention]

5 This invention relates to a handy type cleaner (cleaning apparatus), and more particularly to a cleaner capable of cleaning a narrow gap, or the like reliably and effectively.

[Description of Related Art]

10 Recently, there was proposed a cleaner, as a floor cleaner, including a resilient ridge portion formed on an outer periphery of a base, and an elongate handle connected to the base through a universal joint (Japanese Registered Utility Model Publication No. 3019135). In this floor cleaner, the ridge portion serves as a cushion when the base hits the wall, or the like during cleaning operation.

15 As a room cleaner, there was proposed another handy type cleaner comprising a cleaning cloth, and a cleaner body having a head portion of a soft raw material attached with the cleaning cloth and mounted on a forward end portion of a handle. As such a cleaner, there was heretofore further proposed a cleaner having flaps, such as gathers, fringes, or the like, arranged on a peripheral edge thereof when the cleaning cloth is attached to the cleaner body. Such a cleaner can clean a narrow
20 gap, for example, between keys of a keyboard or the like with the flaps thereof inserted into the narrow gap for absorbing dusts, or the like.

However, a cleaner capable of performing a cleaning in a narrow gap, or the like more reliably and effectively is demanded.

SUMMARY OF THE INVENTION

25 It is, therefore, an object of the present invention to provide a cleaner capable

This Sheet Has Been Replaced


of cleaning a narrow gap, or the like, and more particularly a cleaner capable of cleaning not only dusts but also adhered dirt in a narrow gap reliably and effectively.

The present invention has achieved the above object by providing a handy type cleaner comprising a cleaning cloth, and a cleaner body having a head portion of a soft raw material attached with the cleaning cloth and mounted on a forward end portion of a handle, the head portion being provided on a peripheral edge portion thereof with a flat expanded portion.

Preferred embodiments of the present invention comprise one or more of following required elements (1) through (5).

10 (1) The expanded portion has flexibility, and a stress (load) is 1 to 2000gf when an edge of the expanded portion is shifted by 3 mm vertically to expanded direction thereof.

(2) The expanded portion is 20 mm or less in thickness.

(3) The head portion includes at least one planar cleaning surface, and the expanded portion has a cleaning surface coplanar to and expanded from the planar cleaning surface.

(4) The expanded portion is formed by fixing a thin plate-like member to a head body from its bottom surface side, and the head body has trapezoidal configuration in sectional view.

20 (5) The head portion includes at least one cleaning surface generally parallel to a longitudinal direction of the handle.

In addition, the handy type cleaner has a handle with a length within one meter and is used for cleaning a desk, furniture, narrow gaps, small spaces, and the like other than floor.

25 According to a cleaner of the present invention, a narrow gap or the like can



be cleaned, more particularly, not only dusts but also adhered dirt in a narrow gap or the like can be wiped off reliably and effectively.

And, on the peripheral edge portion of the head portion is provided a flat expanded portion having a width of 5 to 50 mm, accordingly, dirt can be wiped off with the expanded portion inserted into a small gap pressed on the dirt. Therefore, a narrow gap, or the like can be cleaned reliably and effectively.

And, on the peripheral edge portion of the head portion is provided a flat expanded portion having a width of 5 to 50 mm, accordingly, small gap can be cleaned using a cleaning cloth having no flap. Therefore, a narrow gap can also be cleaned with a cleaner attached with a cleaning cloth in a state of no flap side out and flap side in.

According to a cleaner of the present invention comprising the required element (1), the peripheral edge portion (expanded portion) of the head portion has such a degree of flexibility that when the edge of the expanded portion is shifted by 3 mm in a direction vertical to the expanded direction, the stress(load) is 1 to 2000gf. Therefore, a curved surface having a large curvature can also be cleaned efficiently.

According to a cleaner of the present invention comprising the required element (2), the expanded portion is 5 to 50 mm in width and 20 mm or less in thickness. Therefore, the gap between keys of the keyboard of computers, the gap between the rails of a sash, the gap between a television set and the floor, and the like can be cleaned efficiently and reliably.

According to a cleaner of the present invention comprising the required element (3), the expanded portion has a cleaning surface coplanar to and expanded from the planar cleaning surface of the head. Therefore, wider area can be cleaned effectively at a time.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view showing the first example of the present invention.

FIG. 2 is a perspective view showing a cleaner body of the cleaner of the
5 above example.

FIG. 3 is a sectional view taken on line P-P of a head portion of the cleaner of the above example, when viewed in a direction as indicated by arrows.

FIG. 4 is a sectional view showing a state of use of the cleaner of the above example.

10 FIG. 5 is a sectional view showing another state of use of the cleaner of the above example.

FIG. 6 is a plan view showing a head portion of the second example of the cleaner of the present invention.

FIG. 7 is a plan view showing a head portion of the third example of the
15 cleaner of the present invention.

FIG. 8 is a sectional view showing the head portion of the above example.

FIG. 9 is a sectional view showing a head portion of the fourth example of the present invention.

FIG. 10 is a sectional view showing a head portion of the fifth example of the
20 cleaner of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Preferred examples of the present invention will be described hereinafter with reference to Figures.

25 Figs. 1 through 5 show the first example of a cleaner of the present invention.

Fig. 1 is a perspective view showing the cleaner of the first example, Fig. 2 is a perspective view showing a cleaner body of the cleaner of Fig. 1, Fig. 3 is a sectional view taken on line P-P of the head portion of the cleaner of Fig. 1 when viewed in a direction as indicated by arrows, Fig. 4 is a sectional view showing a state of use of the cleaner of Fig. 1, and Fig. 5 is a sectional view showing another state of use of cleaner of Fig. 1.

As shown in Fig. 1 or 2, the cleaner 1 according to the first example is a handy type cleaner comprising a cleaning cloth 3, and a cleaner body 20 having a head portion 21 of a soft raw material attached with the cleaning cloth 3 and mounted on a forward end portion of a handle 21. The head portion 21 is provided on a peripheral edge portion thereof with a flat expanded portion 21a having a width of 5 to 50 mm.

As shown in Fig. 2, the head portion 21 includes a head body 21b connected to the handle 22, and a flat expanded portion 21a provided on a peripheral edge portion of the head body 21b. The head body 21b and the expanded portion 21 are each formed of a porous soft raw material (C hardness = 20 to 35) made of soft ester based urethane foam, a surface of which is subjected to meltome treatment.

The soft raw material forming the head body and the expanded portion 21a is preferably a sponge-like porous soft raw material, or a rubber-like soft raw material.

In case the head portion body or the expanded portion 21a is made of the sponge-like porous raw material, it is particularly preferable to use a porous soft raw material composed of a soft foamed synthetic resin which is excellent in durability. Examples of the preferable porous soft raw material having such properties may include synthetic resin such as foamed polyethylene, foamed polyurethane, and the like.

In case the head body or the expanded portion 21a is made of the above porous soft raw material of synthetic resin, it is preferable to apply a surface treatment

thereto in order to obtain a favorable surface slide-ability, so that the cleaning cloth 3 can be attached/detached smoothly. As a method for providing a favorable surface slide-ability, there can be listed, for example, the meltome treatment (treatment for providing a favorable surface slide-ability), the mold coating treatment, and the like.

5 The soft raw material forming the head body and the soft raw material forming the expanded portion 21a may be the same or different. The soft raw material for forming the head body is preferably 1 to 60 in C hardness, more preferably 20 to 35, and much more preferably 20 to 30. The "C hardness" refers to the hardness obtained through measurement by using a rubber hardness meter C type [ASKER (trade mark)]
10 manufactured by Kobunshi Keiki Kabushiki Kaisha based on SRIS (Japan Rubber Association Specifications) 0101. If the C hardness of the soft raw material is less than the lower limit of the above range, the head body tends to collapse, thus making it unable to satisfactorily wipe off adhered dirt. In contrast, if the C hardness of the soft raw material exceeds the upper limit of the above range, intimacy to a subject to be
15 cleaned is degraded thereby making it unable to clean sufficiently, damaging the subject to be cleaned, and easily tearing the cleaning cloth 3 during the cleaning operation. Although there is no particular limitation about the hardness of the soft raw material forming the expanded portion 21a, it is preferably the same in C hardness as or more than the soft raw material forming the head body and is preferably 90 or less in A
20 hardness, and more preferably is 60 or less in A hardness. The "A hardness" refers to the hardness obtained through measurement by using an A hardness meter based on JIS • K6301.

For measurement of the C hardness of the soft raw material, a sample for measurement is preferably 18mm x 44 mm or more in area and preferably 12 mm or
25 more in thickness. If the thickness is less than 12mm, the compiled subjects can be

measured. In case a sample does not meet those conditions, the measurement can be performed by comparing the hardness under a prescribed condition (thickness and configuration of a sample, state of a substance with which the sample is in contact, and the like).

5 The head body 21b has, in a plan view, a hexagonal configuration having two angular portions on its forward end portion and an larger width towards the backward. The head body 21b is reduced in thickness towards the forward end portion and towards the widthwise direction, and has a trapezoidal configuration in sectional view as shown in Fig. 3, as well as in elsewhere. The angle of the angular portion formed
10 between the lower surface portion 21c and the peripheral surface portion 21d connected thereto is a right angle or an acute angle.

 The head portion 21 has an above configuration, so by inserting the forward end portion and the side edge portion both having a reduced thickness together with the expanded portion 21a and contacting the cleaning cloth 3 with the cleaning subject, it
15 becomes possible to clean a narrow deep gap. Moreover, by pressing the forward end portion and the side edge portion both having a reduced thickness without an expanded portion against the corner portion of the cleaning subject, so that the cleaning cloth 3 intimately contacts to and becomes able to clean the corner. In addition, dust is easily to be stacked in both narrow gap and the corner portion.

20 It is preferred that a lower surface portion (bottom surface portion) of the head portion 21 is flat. However, convexities and concavities may be provided on a part or a whole of the entire surface.

 As shown in Fig. 3, the expanded portion 21a may be integral with the head body. The expanded portion 21a may be provided over an entire area of the peripheral
25 edge portion of the head portion 21, or it may be provided only on a part of the

peripheral edge portion. As shown in Fig.2, it is preferred to provide the expanded portion 21a on the forward end portion and the opposite side edge portions. There is no need of a provision of an expanded portion on a rear end portion of the head portion connected to the handle.

5 The expanded portion 21a is provided on a plane coplanar to one surface of the head body, and more preferably on a plane coplanar to the bottom surface portion of the head body. By providing the expanded portion 21a on the same plane as the head body as seen, the area to be cleaned by one cleaning operation is increased and therefore, a more efficient cleaning can be performed.

10 The expanded portion 21a is 5 to 50 mm in width W, preferably 7 to 30 mm, and more preferably 10 to 30 mm. If the width W is less than 5 mm, it becomes impossible to insert the expanded portion into a narrow deep gap and sufficiently clean the inner side. If the width W is more than 50 mm, it becomes difficult to insert the expanded portion into a narrow gap. Further, the expanded portion 21a is preferably
15 20 mm or less in thickness, and more preferably 10 mm or less. If the thickness exceeds 20 mm, either a narrow gap or a ditch cannot be cleaned sufficiently.

 The "narrow gap" used in this specification refers to a gap formed in a rail of a sash, a gap between the floor or the like and the bottom portion of a television set or an electronic oven, a gap formed between keys of the keyboard of a computer, and the
20 like. Those gaps are usually approximately 20 mm or less. The "width W" of the expanded portion 21a refers to a distance of the boundary portion between the expanded portion 21a and the head body through the outer peripheral edge of the expanded portion 21a.

 The expanded portion 21a preferably has a flexible property. If the
25 expanded portion 21a has a flexible property, it becomes possible to efficiently clean a



curved surface having a large curvature with the expanded portion 21a pressed on the curved surface such that the expanded portion 21a is deformed in conformity with the contour of the curved surface.

This flexibility is preferably to a degree that when an edge of the expanded portion 21a is shifted by 3 mm in a direction vertical to the expanded direction of the expanded portion 21a, the stress becomes approximately 1 to 2000gf, more preferably 10 to 1000gf and much more preferably 10 to 500gf. If the flexibility is to a degree that when an edge of the expanded portion 21a is shifted in the expanded direction thereof, the stress is less than 1gf, the wiping force is weakened and therefore, a reliable cleaning cannot be performed. If the expanded portion 21a has a degree of flexibility that the stress exceeds 2000gf, it becomes difficult to deform the expanded portion 21a in conformity with the contour of a surface having fine convexities and concavities or a curved surface.

The above stress is a load value measured when the head portion 21 is placed and fixed in a state of the expanded portion 21a horizontally projected, and a load is applied to the expanded portion 21a from the above to cause the edge of the expanded portion 21a to bend by 3 mm downward.

In detail, this stress is a load value measured when the edge of the expanded portion 21a is shifted vertically by 3 mm in the expanded direction with a cylindrical measuring portion having a diameter of 4 mm of a load measuring device. In measurement, the cylindrical measuring portion is placed in its peripheral wall superposed on an outer peripheral edge of the longitudinal central portion of the expanded portion 21a.

In the first example, as shown in Fig. 3, the flat expanded portion 21a is integral with the head body 21b, and its lower surface portion is coplanar to the lower

surface 21c of the head body 21b. This expanded portion 21a has a degree of flexibility that when its edge is shifted by 3 mm in the expanded direction of the expanded portion 21a, the stress is 150gf. The expanded portion 21a is 10 mm in width W and 3 mm in thickness T.

5 As shown in Fig. 2, the handle has a forward end portion to which the head portion 21 can be mounted and a rear end portion provided with a grip portion. It is preferred that when the head portion 21 is mounted, the grip portion is curved or bent such that the grip portion becomes higher than the head portion 21.

10 As shown in Fig. 2, the handle 22 comprises a handle body 23 having a grip portion, and an attachment member 24 attached to a forward end portion of the handle body 23. This attachment member 24 is fixedly attached to a cut-out portion 21f of the head body 21b. The head portion 21 includes at least one cleaning surface generally parallel to a longitudinal direction of the handle 22, therefore, the cleaner 1 is favorable in handling.

15 The handle is preferably made of vinyl chloride, polypropylene, ABS, polycarbonate, aluminum, or alloy thereof, wood, or bamboo, because by doing so, the weight can be reduced, the durability is increased, and the cost is lowered. The gravity center of the cleaner 1 is preferably positioned at the head portion 21, for example by making the handle body 23 be of hollow structure.

20 It is preferred that a first fixture portion to which the cleaning cloth 3 attached to the head portion 21 can be fixed is provided on the head portion 21 or the handle. The cleaning cloth 3 is preferably in the form of a bag. In that case, as shown in Fig. 1, an opening portion nearby area of the cleaning cloth 3 is preferably fixed by the first fixture portion. As shown in Fig.2, the first fixture portion 25 is
25 preferably arranged to be able to fix the same portions of the opening portion nearby

area of the cleaning cloth 3, in regular use of the cleaning cloth 3 as well as in upside down use of it.

In case the first fixture portion 25 is provided on the handle, as shown in Fig. 2, it is preferred that an opening portion or a cut-out portion 21f in the fig.2 is formed in area facing the opening portion nearby area of the cleaning cloth 3 attached to the head portion 21, so that a first fixture portion provided on the handle is exposed through the opening portion or the cut-out portion. Particularly, as previously mentioned, in case the handle includes the handle body and the attachment member, the first fixture portion is preferably provided on the attachment member.

In case the first fixture portion is provided on the soft raw material forming the head portion 21, it is preferred that a recess is formed in area of the upper and lower surface portions of the head portion 21 facing the opening portion nearby area of the cleaning cloth 3 attached to the head portion 21, and the first fixture portion is provided in the recess.

The configuration of the first fixture portion is not particularly limited inasmuch as it can assuredly fix the opening portion nearby area of the cleaning cloth 3. Examples of the configuration of the first fixture portion may include, as shown in Fig. 2, one having a plurality of flexible pieces forming a radial slit called "chrysanthemum seat", another one having a surface-like fastener, and a holding plate having an engagement recess and an engagement projection corresponding to the engagement recess, which is fixed to the cleaner through a hinge .

As shown in Fig. 2, it is preferred that the head portion 21 is provided on the expanded portion 21a or on its nearby area with a second fixture portion 26 for fixing the attached cleaning cloth 3 to the head portion 21. By fixing the cleaning cloth 3 to the expanded portion 21a or the nearby area of the expanded portion 21a, the cleaning

cloth 3 is prohibited from getting baggy at the nearby area of the expanded portion 21a and therefore, the expanded portion 21a and the cleaning cloth 3 there-around can be inserted into a narrow gap smoothly. In this way, the narrow gap, or the like can be cleaned more efficiently.

5 The second fixture portion is preferably provided on the nearby area of the expanded portion 21a of the head body rather than on the expanded portion 21a. If the second fixture portion is provided directly on the expanded portion 21a, the expanded portion 21a is increased in thickness due to a provision of the second fixture portion, or gathers are formed on the cleaning cloth 3 fixed to the second fixture
10 portion. As a result, there is a fear that a smooth insertion of the expanded portion 21a into the narrow gap is jeopardized. It should be noted, however, that if the second fixture portion is so thin as an adhesive tape, it may be provided on the expanded portion.

 The configuration of the second fixture portion is not particularly limited
15 inasmuch as it can reliably fix the opening portion nearby area of the cleaning cloth 3. It may take any one of the various configurations which are described with reference to the first fixture portion.

 In the cleaner 1, the cleaning cloth 3 attached to the head portion 21 may be selected from those conventionally known without any particular limitation inasmuch as
20 it can be attached to the head portion 21. It is particularly preferred that the cleaning cloth 3 is fabricated by nonwoven fabrics bonded together to form a bonded portion of a flat bag-like configuration having an insertion space therein, and is provided with a non-bonded portion outside the bonded portion. By doing so, the cleaning can be performed easily.

25 As shown in Fig. 1, the cleaning cloth 3 is fabricated by two span lace

nonwoven fabrics whose peripheral edge portion is cut into a continuous mountain-like configuration, which fabrics are bonded together by heat sealing to form a flat bag-like configuration having an insertion space therein. The cleaning cloth 3 of the first example is provided with a bonded portion 31 of a width of 5 mm and of a configuration having two angular portions 31a on a forward end portion thereof. Outside this bonded portion 31, there is a provision of a non-bonded portion 32 having a width of 10 mm to 30 mm along the peripheral edge portion of the cleaning cloth 3. A slit 34 is formed in one side portion of the cleaning cloth 3, so that the cleaning cloth 3 can easily be attached and detached.

The nonwoven fabrics fabricating the cleaning cloth 3 are particularly preferably those made of fibrous material having an excellent dust absorption and an excellent wear resistance. Examples of the preferred nonwoven fabric having such properties may include a span lace nonwoven fabric, a span bonded nonwoven fabric, a suction nonwoven fabric, a heat-bonded nonwoven fabric, a melt blown nonwoven fabric, and the like.

The fibrous composition fabricating the nonwoven fabric may appropriately be selected depending on the bonding form. In case the nonwoven fabrics are bonded together by heat sealing, as later described, to form the cleaning cloth 3, the cleaning surface of the nonwoven fabric is preferably made, for example, of polyethylene terephthalate (PET) and its bonded surface is preferably made, for example, of conjugated fiber (core/sheath) of PET/polyethylene (PE).

Although it is preferred that the cleaning cloth 3 is in the form of a bag, a rectangular sheet, which is not bag-like, having a dimension large enough to cover up the head portion 21 may also be used. In this case, the sheet-like cleaning cloth 3 can easily be put upside down, and both surfaces can more easily be utilized than the bag-

like cleaning cloth 3.

The configuration of the bonded portion is preferably in correspondence with the configuration of the head portion 21. For example, it is preferred that the bonded portion is provided on its forward end portion with an angular portion, or in the configuration of the letter U-shape in plan view or the letter V-shape in plan view, and the like. The bonded portion may be provided by sewing other than several kinds of sealing method. In case the bonded portion is provided by a sealing method, its width is 20 mm to 0.1 mm and preferably 10 mm to 1 mm, so that a desired strength can be obtained. The sealing methods may include the ultrasonic sealing method, the sealing method using a hot melt adhesive agent, the heat sealing method, and the like.

The cleaning cloth 3 may have flaps 33 provided on its peripheral edge when it is mounted on the cleaner body 2. In case the cleaning cloth 3 is obtained by forming a nonwoven fabric, or the like, into the configuration of a bag or a cylinder, the flaps can be formed by utilizing the end portions of the nonwoven fabrics, or the like. As shown in Fig. 1, the flaps can be formed by providing a non-bonded portion outside the bonded portion and cutting the non-bonded portion into a predetermined configuration, or forming a slit therein.

The width of the non-bonded portion provided outside the bonded portion is 1 mm to 50 mm, and preferably 5 mm to 30 mm from the peripheral edge portion of the nonwoven fabric. If the width is narrower than 1 mm, the dust absorbing effect of the non-bonded portion is almost totally lost. In contrast, if the width exceeds 50 mm, the stiffness of the non-bonded portion is lost, and therefore the cleaning operation is difficult to be carried out.

Although the non-bonded portion is preferably provided in correspondence with the bonded portion, it may be provided on a part outside the bonded portion.

On the use of the cleaner 1, first, the handle 22 is assembled from the handle body 23 and the attachment member 24. Next, the head portion 21 is fixed to the attachment member 24 to be the state of Fig. 2. Next, the head portion 21 is inserted into the insertion space of the cleaning cloth 3 to attach the cleaning cloth 3 to the head portion 21. At that time, since the meltome treatment is applied to the surface of the head portion 21, the cleaning cloth 3 can be attached smoothly. Next, the opening portion nearby area 3a of the cleaning cloth 3 is pushed into the first fixture portion 25 and as shown in Fig. 3, the inner side of the bonded portion 31 is pushed into the second fixture portion 26 in order to fix the cleaning cloth 3 to the head portion 21.

Tables, desks, and the like having a comparatively large area are cleaned chiefly with the inner side of the bonded portion 31 of the cleaning cloth 3. Narrow gaps, or the like, such as the gap between keys of the keyboard of computers, the gap between the rails of a sash, the gap between the bottom portion of a television set and the floor, and the like are cleaned by inserting the expanded portion 21a of the head portion 21 into such gaps, or the like so as to be urged against the keys, or the like, such that the inner side of the bonded portion 31 and the non-bonded portion 32 are intimately contacted with a dirty spot to wipe off the dirt.

When a curved surface having a large curvature is to be cleaned, as shown in Fig. 4, the expanded portion 21a is abutted against the curved surface through the cleaning cloth 3 such that the expanded portion 21a is deformed along the contour of the curved surface. By doing so, an efficient cleaning can be performed.

When a high place such as a beam, a frame, or the like is to be cleaned, as shown in Fig. 5, the cleaner 1 is put upside down to keep the position of the holding hand low, and in that state, a cleaning is performed with the expanded portion 21a.

When the surface of the cleaning cloth 3 gets extremely dirty, first, the

cleaning cloth 3 is removed from the first fixture portion 25 and the second fixture portion 26. Next, the opening portion nearby area 3a of the cleaning cloth 3 is picked up and the cleaning cloth 3 is removed in such a manner as to be peeled off the head portion 21. Next, the removed cleaning cloth 3 is put inside out and attached once again to the head portion 21. By doing so, the front and back side of the cleaning cloth 3 can be used efficiently. At that time, although the flaps 33 are arranged inside the cleaning cloth 3, the cleaning cloth 3 is deformed along the contour of the expanded portion 21a around it. Therefore, the inner side of a narrow gap, or the like can be cleaned by the cleaner of this state, too.

10 According to the cleaner 1 of the first example, since on the peripheral edge portion of the head portion 21 is provided the flat expanded portion 21a, even in a narrow gap, dust can be absorbed and dirt can be wiped off. Thus, a narrow gap, a ditch and the like can be cleaned reliably and effectively.

And, a narrow gap can be cleaned without a need of a provision of flaps. A
15 narrow gap can also be cleaned with the cleaning cloth having no flap and with the cleaning cloth 3 put flaps 33 into it.

According to the cleaner 1 of the first example, since the expanded portion 21a has a degree of flexibility that when an edge of the expanded portion 21a is shifted by 3 mm in a direction vertical to the expanded direction thereof, the stress is 150gf, it
20 can be deformed along the contour of a curved surface having a large curvature. Therefore, a curved surface having a large curvature can also be cleaned efficiently.

According to the cleaner 1 of the first example, since the expanded portion 21a is provided on a lower portion of the head body 21b, a high place such as a beam, a frame, or the like can be cleaned easily with the expanded portion 21a by putting the
25 cleaner 1 upside down to keep the position of the holding hand low.

According to the cleaner 1 of the first example, the cleaning cloth 3 is fixed to the head portion 21 in the nearby area of the expanded portion 21a by the second fixture portion 26 and the cleaning cloth 3 is disposed along the expanded portion 21a in the nearby area of the expanded portion 21a. Therefore, the expanded portion 21a can be inserted into a narrow gap smoothly and a narrow gap, or the like can be cleaned more efficiently.

Fig. 6 is a plan view showing a head portion of the second example of a cleaner of the present invention. Identical members of the first example shown in Figs. 1 through 5 are denoted by identical reference numeral in the second example and description thereof is omitted.

In the cleaner 1 of the second example, as shown in Fig. 6, the expanded portion 21a is provided only on the forward half of the head portion 21.

The construction of the second example is the same as the first example except that the expanded portion 21a is provided only on the forward half of the head portion 21.

The similar function and effect as in the first example can also be obtained in the second example.

In this way, if the expanded portion 21a is provided on at least a part of the peripheral edge portion of the head portion 21, a narrow gap can be wiped with the expanded portion 21a and therefore, a narrow gap, or the like can be cleaned reliably and effectively.

Fig. 7 is a plan view showing a head portion of the third example of a cleaner of the present invention, and Fig. 8 is a sectional view showing the head portion of Fig. 7.

Identical members of the first example shown in Figs. 1 through 5 are also

denoted by identical reference numeral in the third example and description thereof is omitted.

In the cleaner 1 of the third example, as shown in Fig. 7, the head body 21b is in a semi-arcuate configuration in a plan view, gradually enlarging from the forward end towards the backward end. As shown in Fig. 8, the head body 21b is in a spindle shape in sectional view, which is thickest at its center in the axial direction and gradually reduced in thickness towards the left and right opposite side edges. The expanded portions 21a are continuous with the left and right opposite side edges of the head body 21b.

10 The construction of the third example is the same as of the first example only excepting the configuration of the head body 21b and the locations of the expanded portions 21a.

In this way, even if the lower surface 21c of the head body 21b is not planar and the expanded portion 21a is not provided on the lowermost of the head portion 21, a narrow gap can be wiped with the expanded portion 21a and therefore, a narrow gap, or the like can be cleaned reliably and effectively.

Fig. 9 is a sectional view showing a head portion of the fourth example of a cleaner of the present invention. Identical members of the first example shown in Figs. 1 through 5 are also denoted by identical reference numeral in the fourth example and description thereof is omitted.

In the cleaner 1 of the fourth example, as shown in Fig. 9, the second fixture portion 26 is a groove formed directly in the head body 21b along each side edge of the head body 21b. The cleaning cloth 3 is fixedly held in this groove.

25 The construction of the fourth example is the same as the first example excepting the configuration of the second fixture portion 26.

In this way, even with the use of other member than a clipper as the second fixture portion 26, it is possible that the cleaning cloth 3 is disposed along the expanded portion 21a in its nearby area, and the expanded portion 21a is inserted into a narrow gap smoothly. Therefore, a narrow gap, or the like can be cleaned more efficiently.

5 Fig. 10 is a sectional view showing a head portion of the fifth example of a cleaner of the present invention. Identical members of the first example shown in Figs. 1 through 5 are also denoted by identical reference numeral in the fifth example and description thereof is omitted.

10 In the cleaner 1 of the fifth example, as shown in Fig. 10, the expanded portion 21a is formed by fixing a thin plate-like member to a head body 21b from a bottom surface side (the longer side in sectional view). The head body has a trapezoidal configuration in sectional view. The fifth example is the same as the first example only except that the expanded portion 21a is formed by fixing a separate member.

15 The similar function and effect of the first example can also be obtained in the cleaner 1 of the fifth example. Further, according to the cleaner 1 of the fifth example, the expanded portion 21a can be formed from a raw material having a different softness from that which forms the head body 21b and the range of the flexibility of the expanded portion 21a can be set freely.

20 Next, in the cleaner 1 of the first example, the stress, the width, the thickness, and the hardness of the raw material of the expanded portion 21a were varied and the cleaning effect of the expanded portion was checked. Then comparative tests were carried out using a cleaner (Comparative Example ①) having no expanded portion and a cleaner (Comparative Example ②) in which the expanded portion is 3mm in width, 4 mm in thickness, and the raw material hardness is A-47. Regarding the
25 cleaning effect, the cleaning effects in a narrow gap and on a curvature were checked.

The results are shown in Table 1.

<CLEANING EFFECT IN GAP>

A cleaning is performed in a gap between two opposing planes opposing each other with a vertical interval of 20 mm and the clean-able depth was measured in the
5 lower plane.

<CLEANING EFFECT ON CURVATURE>

The expanded portion 21a whose expanded direction was slanted by approximately 45 degrees with respect to the axial direction of a sectionally arcuate member of $R = 12$ cm was abutted with an outer curved surface of the sectionally
10 arcuate member, and the width (length in a direction perpendicular to the axis of the sectionally arcuate member) of the outer curved surface with which the expanded portion 21a was abutted, was measured.

TABLE 1

		expanded portion				cleaning effect		others
		stress (gf)	width (mm)	thickness (mm)	hardness	gap (mm)	curvature (mm)	
Comparative	①	no expanded portion				2 7	5 3	
Examples	②	unable to measure	3	4	A-4 7	2 4	3 5	
Examples	①	1 4 9	1 0	3	C-2 8	3 3	6 8	
	②	1 5 8 8	8	4	A-9 0	2 9	5 0	* 1
	③	8 0 6	1 5	4	A-9 0	3 6	5 8	
	④	3 8 7	1 0	4	A-4 7	3 1	7 5	
	⑤	2 8 2	5 0	1 6	A-4 7	5 5	7 3	
	⑥	1 4 4	1 5	3	A-4 7	3 8	8 0	
	⑦	4 3	3 0	4	A-4 7	5 1	9 3	
	⑧	1	1 0	1	—	3 5	7 0	* 2

* 1: rather difficult to clean a small space

* 2: wipe-ability is slightly weak with respect to the expanded portion

As apparent from the results of Table 1, the cleaner of the first example can clean the gap and the curved surface reliably and effectively.

The cleaner of the present invention is not limited to the cleaner 1 of the above examples. The dimension, the configuration, the material, and the like of the
5 cleaner can appropriately be changed, as long as in a cleaner comprising a cleaning cloth 3, and a cleaner body having a head portion of a soft raw material attached with the cleaning cloth 3 and mounted on a forward end portion of a handle, the head portion is provided on a peripheral edge portion thereof with a flat expanded portion.



THIS SHEET HAS BEEN
REPLACED

WHAT IS CLAIMED IS:

1. A handy type cleaner comprising a cleaning cloth, and a cleaner body having a head portion of a soft raw material attached with said cleaning cloth and mounted on a forward end portion of a handle, said head portion being provided on a peripheral edge
5 portion thereof with a flat expanded portion having a width of 5 to 50 mm.
2. The cleaner according to claim 1, wherein said expanded portion has flexibility, and a stress is 1 to 2000gf when an edge of said expanded portion is shifted by 3 mm vertically to an expanded direction thereof.
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3. The cleaner according to claim 1, wherein said expanded portion is 20 mm or less in thickness.
4. The cleaner according to claim 1, wherein said head portion includes at least
15 one planar cleaning surface, and said expanded portion having a cleaning surface coplanar to and expanded from said planar cleaning surface.
5. The cleaner according to claim 1, wherein said expanded portion is formed by fixing a thin plate-like member to a head body from its bottom surface side, and said
20 head body has trapezoidal configuration in sectional view.

