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CLEANER DEVICE

This invention relates to a cleaner device adapted to be detachably equipped with a wipe-out sheet.

Japanese Utility Model No. 3019135 discloses a cleaner device including a rectangular plate-like assembly provided on its top surface with two pairs of clamping means along respective long sides of this rectangular plate-like assembly serving to clamp the wipe-out sheet on said plate-like assembly. Marginal portions of the wipe-out sheet placed against the bottom surface of said plate-like sheet are folded onto the top surface of said plate-like assembly and fastened thereto by said clamping means.

With such cleaner device of prior art, four clamping means must be successively opened in order to remove the wipe-out sheet from the plate-like assembly. Obviously, it will be preferable for user of such device that the wipe-out sheet can be removed from the plate-like assembly as easily as possible.

In view of this requirement to be met, it is a principal object of the invention to facilitate the wipe-out sheet to be detachably attached to the cleaner device of the

above-mentioned type.

The object set forth above is achieved, according to the invention, by a cleaner device comprising a rectangular plate-like assembly defined by a pair of short sides extending in parallel to each other together with a pair of long sides extending in parallel to each other, said two pairs crossing at right angles, a stick mounted on the top surface of said plate-like assembly, and a wipe-out sheet detachably attached to said plate-like assembly by releasably clamping means provided on said top surface of said plate-like assembly so as to cover the bottom surface of said plate-like assembly, said cleaner device being characterized by that: said releasably clamping means comprise two groups of members located symmetrically with respect to a first center line bisecting said pair of long sides and spaced from each other by a relatively large distance; each of said two groups includes one of two clamping members located symmetrically with respect to a second center line bisecting said pair of short sides and spaced from each other by a relatively small distance and one of two clamping control members disposed between the associated one of said two clamping members and said plate-like assembly so as to straddle said second center line; each of said clamping

members has an inner end and an outer end opposite to said inner end as viewed along said second center line, said clamping member being pivotally mounted on said plate-like assembly at said inner end lying adjacent said first center line, and said outer end defining a free end in the form of a tab adapted to be held by fingers to erect or collapse said clamping member relative to said top surface of said plate-like assembly so that marginal portions of said wipe-out sheet may be inserted between said clamping member and said top surface when said clamping member is erected and may be clamped between said clamping member and said plate-like assembly when said clamping member is collapsed into engagement with said plate-like assembly; and each of said clamping control member has an inner end and an outer end opposite to said inner end as viewed along said second center line, said clamping control member being pivotally mounted on said plate-like assembly at said inner end lying adjacent said first center line, and said outer end defines a free end in the form of a tab extending outward beyond the free end of the associated clamping member in the direction of said second center line when the clamping member is in its collapsed position.

Fig. 1 is a perspective view showing the cleaner device according to the invention;

Fig. 2 is a sectional view taken along a line B-B in Fig. 1;

Fig. 3 is a fragmentary perspective view showing the plate-like assembly as the clamping member being in opened state; and

Fig. 4 is a view similar to Fig. 2 illustrating a manner in which the wipe-out sheet is clamped.

Details of the cleaner device according to the invention will be more fully understood from the following description given hereunder in reference with the accompanying drawings.

A cleaner device 1 shown by Fig. 1 in a perspective view comprises a plate-like assembly 2, a stick 4 connected in the conventional manner by a universal joint 3 to the plate-like assembly 2 and a wipe-out sheet 5 attached to the plate-like assembly as shown by imaginary lines. It should be understood that the stick 4 is shown as partially broken away.

The plate-like assembly 2 is configured in a rectangle defined by a pair of long sides 7A extending transversely

with respect to the course of cleaning operation and a pair of short sides 7B extending orthogonally to said long sides 7A. The assembly 2 comprises a main body 8 of hard plastic material and an elastic member 9 covering a bottom surface and a peripheral wall 20 (Fig. 2) of the main body 8. A top surface 10 of the main body 8 is formed, at the middle of a second center line B-B dividing the pair of short sides 7B in two, with a pair of projections 11 for mounting of the universal joint 3. The top surface 10 is additionally formed, symmetrically with respect to a first center line A-A dividing the pair of long sides 7A, a pair of recesses 16, respectively. These recesses 16 are spaced from each other by a relatively large distance and have their substantially entire areas covered with respective sheet clamping means 13.

The clamping means 13 include a pair of clamping members 13A provided symmetrically with respect to said second center line B-B and closely adjacent to each other. These clamping members 13A are mounted on the top surface 10 of the main body 8 so as to be pivotable around their inner ends 14 lying adjacent said first center line A-A. The clamping members 13A can be erected or collapsed with respect to the main body 8 with their outer ends 15 lying adjacent the respective short sides 7B. Therefore, marginal portions

46 of the wipe-out sheet 5 may be placed over the recesses 16 after the clamping members 13A have been erected in the direction as indicated by an arrow P and then said clamping members 13A may be collapsed to hold the sheet 5 between the top surface 10 and the members 13A. Clamping control members 21 underlie the pair of collapsed clamping members 13A and outer ends 22 of said control members 21 extend beyond the respective outer ends 15 of the respective clamping members 13A toward the respective short sides 7B.

The stick 4 is made of hard plastic material and pivotable in two directions as indicated by double-headed arrows Q and R.

Fig. 2 is a sectional view taken along a line B-B in Fig. 1 and shows one of the clamping members 13A as being erected. In the plate-like assembly 2, the elastic member 9 has its side wall 31 tightly engaged with a flange 22 formed along a peripheral wall 20 of the main body 8. The peripheral wall 20 and the side wall 31 are substantially integral with each other. The member 9 completely covers a bottom side of the main body 8 and thereby forms a lower surface 23 of the plate-like assembly 2. A plurality of ribs 24 project downward from the bottom side of the main body 8 and bear against an inner surface of the elastic member 9

from above. The elastic member 9 includes, in addition to its peripheral side wall 31, a second side wall 30 having an inverted L-shaped cross-section extending outside said peripheral side wall 31. This second side wall 30 comprises a proximal or inner section 32 located above the side wall 31 of the member 9 and a distal or outer section 33 slightly extending outward from said proximal section 32 and then extending downward. In this manner, said distal or outer section 33 is spaced from the side wall 31 by a distance d.

Fig. 3 is a fragmentary perspective view showing the plate-like assembly 2, in which the clamping members 13A are in their erected positions. The clamping members 13A are made of hard plastic material and include locking jaws 35 formed on bottom surface of their outer ends 15, respectively. These locking jaws 35 are destined to be engaged with corresponding locking jaws 36 formed on the main body 8 in a latch fashion as the clamping members 13A are collapsed. The bottom surfaces of the respective clamping members 13A are formed on transversely opposite sides thereof with pairs of locking means 37 extending downward and having their forward ends in the form of sawteeth. These locking means 37 are firmly inserted into corresponding pairs of grooves formed in the respective recesses 16 as the clamping

members 13A are collapsed.

Each of the clamping member 13A has its inner end 14 pivotally mounted on the main body 8 by means of a pivot pin 26 extending in the direction orthogonal to the second center line B-B. The inner end 14 has its tip 14A being pressed against leaf spring means 28 as the clamping member 13A is erected or collapsed. These leaf spring means 28 are defined by slits 27 extending in parallel to the second center line B-B and slits (not shown) orthogonal to said slits 27 both formed in the inner end of the recess 16. Under the effect of such leaf spring means 28, the clamping member 13A is stabilized once it has been erected or collapsed.

The clamping control members 21 extend straddling the second center line B-B so as to be spaced from each other along said second center line B-B and adapted to be put against the bottom surfaces of the respective clamping members 13A. The clamping control members 21 have their inner ends 29 pivotally mounted on the main body 8 by means of said pivot pins 26. The respective inner ends 29 are put against said leaf spring means 28 formed in the recesses 16 and thereby stabilized as the clamping control members 21 are erected or collapsed.

The clamping control members 21 can be erected or

collapsed with respect to the main body 8 independently of the pair of clamping members 13A while these both members are mounted on the main body 8 commonly by means of the pivot pins 26. However, once all these members 21, 13A have been collapsed, the clamping control members 21 may be turned upward to urge the pair of clamping members 13A upward and thereby to erect them. A strip of male tape 41 constituting one component of paired tape fastener known by the trade name of Magic Tape is affixed to the main body 8 between said pair of grooves 39 in each recess.

Operation of the device 1 constructed as has been described above begins with erecting the respective clamping members 13A with or without use of said clamping control members 21. Then, the wipe-out sheet 5 is put over the bottom surface 23 of the plate-like assembly 2 and the marginal portions 46 (Fig. 1) of the sheet 5 are folded along the respective long sides 7A onto the top surface 10 of the plate-like assembly 2. The marginal portions 46 thus folded are fastened to the strip of tape 41 so that these marginal portions 46 may cover the grooves 39. Then the clamping control member 21 and the clamping members 13A are collapsed to hold the sheet 5 between the side walls of the locking means 37 and the side walls of the grooves 39.

Simultaneously, the sheet 5 is engaged with the sawtoothed tips of the locking means 37. Such double fastening effect of engagement and holding or any one of these two effects ensures that the sheet 5 is never removed from the plate-like assembly 2 during operation of cleaning a floor or the like. In addition, the presence of the elastic second side wall 30 (Fig. 2) surrounding the plate-like assembly 2 is effective in that the distal or outer section 33 of the second side wall 30 is elastically deformed inward in a horizontal plane defined by the plate-like assembly 2 and then tends to restore its initial position as the marginal portions 45 are fastened to the strip of tape 41 and the clamping members 13A are collapsed so as to tension the sheet 5. Restoration of said distal or outer section 33 causes the sheet 5 to be further tensioned and thereby to be tightly held on the bottom surface 23 of the plate-like assembly 2.

With a specific embodiment of the plate-like assembly 2 shown by Fig. 4, marginal portions 47 of the wipe-out sheet 5 are folded along the respective short slides 7B. The clamping control members 21 are placed upon the marginal portions 47 thus folded and the clamping members 13A are placed upon these clamping control members 21. In the case of a relatively wide sheet 5, the sheet can be efficiently

used by attaching the sheet 5 to the cleaner device 1 in the manner as shown.

In the cleaner device 1 according to the invention, a length ratio of the short side to the long side can be optional.

The cleaner device according to the invention allows the wipe-out sheet to be rapidly attached to or detached from the device since the pair of sheet clamping members can be erected at once by using the clamping control members.



WHAT IS CLAIMED IS:

1. Cleaner device comprising a rectangular plate-like assembly defined by a pair of short sides extending in parallel to each other and a pair of long sides extending in parallel to each other, said two pairs crossing at right angles, a stick mounted on the top surface of said plate-like assembly and a wipe-out sheet detachably attached to said plate-like assembly by releasably clamping means provided on said top surface of said plate-like assembly so as to cover the bottom surface of said plate-like assembly, said cleaner device being characterized by that:

said releasably clamping means comprise two groups of members located symmetrically with respect to a first center line bisecting said pair of long sides and spaced from each other by a relatively large distance;

each of said two groups includes one of two clamping members located symmetrically with respect to a second center line bisecting said pair of short sides and spaced from each other by a relatively small distance and one of two clamping control members disposed between the associated one of said two clamping members and said plate-like assembly so as to straddle said second center line;



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each of said clamping members has an inner end and an outer end opposite to said inner end as viewed along said second center line, said clamping member being pivotally mounted on said plate-like assembly at said inner end lying adjacent said first center line, and said outer end defining a free end in the form of a tab adapted to be held by fingers to erect or collapse said clamping member relative to said top surface of said plate-like assembly so that marginal portions of said wipe-out sheet may be inserted between said clamping member and said top surface when said clamping member is erected and may be clamped between said clamping member and said plate-like assembly when said clamping member is collapsed into engagement with said plate-like assembly; and

each of said clamping control member has an inner end and an outer end opposite to said inner end as viewed along said second center line, said clamping control member being pivotally mounted on said plate-like assembly at said inner end lying adjacent said first center line, and said outer end defines a free end in the form of a tab extending outward beyond the free end of the associated clamping member in the direction of said second center line when the clamping member is in its collapsed position.



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2. Cleaner device according to Claim 1, wherein respective each of said clamping members and each of said clamping control members have a common pivot pin.