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54 Scrubbing brush with mouthpiece for fitting the handle with adjustable inclination for cleaning and levelling floors of any type by means of a sturdy brush made of thermoplastic resins.

57 This invention concerns a utility model for sweeping, raking, scraping and levelling flooring of any kind in that the same is fitted with a sturdy brush made of a resistant mixture of thermoplastic resins and fitted on the top with a handle with adjustable inclination.

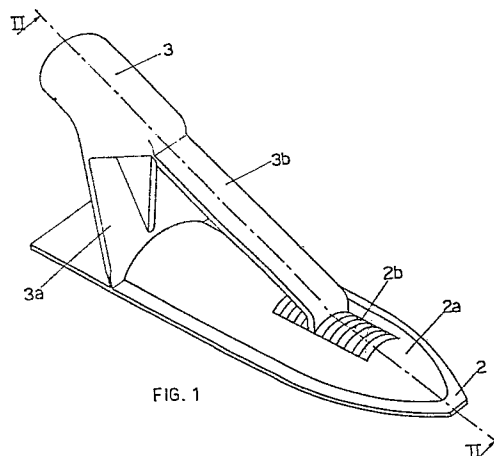


FIG. 1

## Description

### Scrubbing Brush with a Mouthpiece for Fitting the Handle with Adjustable Inclination for Cleaning and Levelling Flooring of Any Kind by Means of a Sturdy Brush Made of Thermoplastic Resins

This invention concerns a scrubbing brush made of extremely resistant plastic materials for sweeping, raking, scraping and levelling flooring of any kind.

This invention was designed in order to introduce an exceptionally versatile and efficient tool in the technique used in this sector, and to carry out at the same time, all those operations for which a number of different tools have to date been required.

It is a well known fact that traditional heather brooms are currently used to remove and collect refuse, different types of dry or wet debris, snow, mud or liquid excrement when cleaning roads, squares, markets, factories, warehouses, stables or similar buildings; rakes or small hoes are used for raking or levelling gardens or any other space used for agricultural purposes.

The characteristics and shape of the scrubbing brush in question make it suitable for replacing the various tools used to date, practically and safely since its versatility makes it efficient in any of the conditions and for the purposes described above.

The tool in question consists of a large scrubbing brush made of a resistant mixture of thermoplastic resins and fitted at the bottom with a set of sturdy but elastic blades, arranged in a preset geometric pattern, capable not only of collecting and sweeping away refuse of any type, but also of disintegrating even the most resistant masses of dust, soil or different types of debris.

This scrubbing brush is fitted on a supporting plate above which the long handle for maneuvering the tool is fitted by means of a coupling sleeve with various adjustment positions.

The most significant feature of this new model is undoubtedly the structure and the shape of the scrubbing brush which is fitted with numerous blades turned downwards and arranged to work together as efficiently and practically as possible.

These blades are in fact arranged in two directions, some longitudinally with respect to the major axis of the scrubbing brush and others transversely; regardless of whether the scrubbing brush is used with alternating movements parallel to its longitudinal axis or with alternating movements orthogonal to its longitudinal axis, with this arrangement there are some blades, under the scrubbing brush, which operate flat to collect and sweep the dirt and the other blades which are orthogonal to the previous blades that operate edgewise blades to disintegrate solid dirt masses, like a blade.

Of particular importance is the fact that in order to achieve this important practical feature, the blades, above all the orthogonally arranged blades, must be suitably spaced so that when a blade is bent towards the adjacent or orthogonal blade as a result of flooring friction, it does not cover the end section of the latter so that the same is not prevented from cutting and consequently removing solidified debris firmly fixed to the flooring.

It is important to reiterate that both the blades

arranged longitudinally and those arranged transversely with respect to the longitudinal axis of the brush are positioned so as to cover together the full surface on which the scrubbing brush is used in both directions with alternating movements over the space to be cleaned; this arrangement is extremely important since it is this feature which makes it possible for the scrubbing brush in question to clean any surface uniformly without leaving behind even the smallest trace of dirt as often happens in the case of rakes or brooms where small residues wedge between the teeth of a rake or the bristles of a broom.

In view of this arrangement of the bottom blades, the scrubbing brush in question acts like a scraper in terms of compactness and continuity, with the difference in respect to a standard blade that it can in addition disintegrate and sweep the dirt as the user requires.

For major clarity the description of the invention continues with reference to the enclosed tables which are intended for illustrative purposes and not in a limiting sense in which:

- figure 1 is an axonometric illustration of the supporting plate for the above scrubbing brush complete with adjustable mouthpiece for fitting the handle;
- figure 2 is the cross-section with the longitudinal plane II-II of figure 1;
- figure 3 is a plan view of the scrubbing brush;
- figure 4 is a side view of the tool according to the invention, complete with all its components.

With reference to the enclosed figures the invention consists of a brush (1) made of a resistant mixture of thermoplastic resins, fitted under a supporting plate (2) fitted at the top with a mouthpiece (3) in which the handle of the tool is fitted.

With particular reference to figure 3, the brush (1), which is rectangular in shape with a fairly accentuated point at the front, has many blades on the bottom face by means of which the scrubbing brush actually operates on the surface to be cleaned; some (1a) of which are arranged peripherally along the three rectilinear sides of the brush, while others (1b) are arranged inside the surface of the brush parallel with respect to the longitudinal axis of the same, others (1c) are arranged inside the surface of the scrubbing brush in an orthogonal position with respect to this longitudinal axis and yet others (1d) are arranged on the pointed front edge of the scrubbing brush, slightly apart, with respect to the longitudinal median axis of the scrubbing brush.

As mentioned, the longitudinal blades and the transverse blades must together cover a continuous surface in two directions under the brush (1) so as to prevent the dirt from penetrating and therefore escaping between the blades; regarding the space

between the blades in the middle section, it is worth reiterating that this space is not only constant from one end of the brush (1) to the other but is a function of the height of the blades in that never does a blade bent by the friction with the flooring, abut against the adjacent blade placed orthogonally to it, so as to cover the end section completely, to avoid loosing the cutting action on the dirt which, in the brush according to the invention, is carried out by those blades which operate edgewise.

Consequently, only by appropriately spacing the adjacent blades placed orthogonally to each other, can this damaging effect, which would reduce the practicality of the brush (1) according to the invention, be avoided.

Regarding these blades, it should be noted that those (1d) on the edge of the pointed front edge of the brush (1) are positioned slightly apart with respect to the median longitudinal axis of the same, since in this configuration the same are more practical.

The fact that the brush (1) has a tapered front end, allows the user to reach even very narrow corners, while the fact that the blades (1d) are positioned slightly apart makes it not only possible to clean these difficult areas more thoroughly but also to prevent the brush (1) from spreading the dirt swept away with its front end; in fact the arrangement of these front blades (1d) produces an important action, particularly when the brush (1) in question is used with transverse movements, in that it pulls the dust and debris collected in towards the surface of the brush (1) without leaving even the smallest trace of dirt on the flooring.

As mentioned, this brush (1) must be connected to a matching supporting plate (2); this coupling can either be fixed and permanent or easily removable to allow a brush which is worn by extended use to be replaced on the supporting plate (2) in question.

For easy coupling and fast replacement of the brush (1) of the plate (2), the brush (1), peripherally on its top face, has a continuous edge segmented at a certain width in which the matching periphery edges of the above plate (2) are fitted.

This supporting plate (2) made of moulded plastic material has a matching surface which is however smaller than the brush (1) fitted underneath, the same being fitted with a longitudinal raised profile (2a) extending from the front end for approximately three quarters of its length.

A supporting bracket (3a) for a mouthpiece with a circular transverse cross-section (3) produced during moulding together with the supporting plate (2), on which a standard handle for using the brush is fitted, projects from the top edge of this longitudinal profile (2a).

It should be noted in this regard that the moulding material of the section where the bracket (3a) is fixed transversely to the top face of the plate (2), has a lighter section which acts as a joint or a hinge to allow the mouthpiece (3) and consequently the handle fitted on the same, to be placed in different inclinations with respect to the flat surface of the supporting plate (2). In order to adjust and fix the different inclinations of the mouthpiece (3) the same

is fitted with along front lever (3b), also produced during moulding, which is slightly curved at the front end, and which fits and is fixed by alternating forced movements into one of the hollows of a comb (2b) on the back of the raised profile (2a) of the supporting plate (2).

Obviously to ensure full efficiency in adjusting the inclination of the mouthpiece (3), the moulding material has another lighter section in the area in which the above lever (3b) is fixed to the mouthpiece (3), which again acts as a joint or a hinge.

With reference to the comb (2b), it should be noted that the same is housed at a certain depth in a matching hollow realized on the above raised profile (2a) of the plate (2); this is an extremely interesting feature in that in this way the folded front end of the lever (3b) of the mouthpiece (3) penetrates at a considerable depth in the various alternating housings of the comb itself (2b), in which the same remains housed both in a longitudinal and in a transverse direction.

Of particular importance is the housing function of the longitudinal side walls of the hollow in which the comb (2b) is fitted; this in fact prevents the lever from moving sideways and consequently from transmitting dangerous transverse strain to the mouthpiece (3) which could be produced were the lever (3b) free to translate freely sideways.

It is clear that a tool of this kind can only be fully practical if it is extremely sturdy; in this regard of particular importance is the fact that on the plate (2) supporting the brush (1) there are two support points for the mouthpiece (3) and consequently for the handle fitted on the same.

The action by the user on the handle of the tool according to the invention is in fact discharged both on the point at which the bracket (3a) of the mouthpiece (3) is fitted to the back of the profile (2a) of the supporting plate (2) and on the insertion point of the lever (3b) of the mouthpiece (3) in the comb (2b); this makes it possible to operate an equiverse and parallel torque on the supporting plate (2), which prevents rotation on the horizontal plane of the brush (1) to make the latter as useful as possible both when it is used longitudinally and when it is used transversely.

It should be noted that within the scope of the invention, the comb could be moved directly on the mouthpiece (3), but in this case an end of the lever (3b) would be fixed to the back of the raised profile (2a) of the plate (2); a double comb could even be fitted, one on the profile (2a) of the plate (2) and another on the mouthpiece (3) in which the free ends of a specially designed connection lever could be fitted.

Finally it should be noted that any combs possibly realized on the tool according to the invention are realized by an alternation of transverse hollows (C) and transverse raised sections (P) suitably shaped to obtained mushroom shaped transverse cross-sections; these raised sections (P) must be fairly elastic so as to become thinner to allow the end of the lever (3b) to be fitted into the hollow (C) as required, and must then return to their normal size so as to at least partially obstruct the hollow (C) in

which the lever which projects from the mouthpiece (3) is fitted, to prevent this lever from escaping accidentally.

In order to obtain this feature on these transverse raised sections (P), these have a longitudinal groove, produced in any way whatsoever, for their complete length to give them the elasticity required.

A top view (fig. 5) and a longitudinal cross-section (fig. 6) of a comb (2b\*) are given in figures 5 and 6 - which, instead of being inserted and built-into a special hollow on the back of the supporting plate (2) as in the case of the previous version - is produced in a single moulded piece with the plate (2).

In this one-piece version the transverse raised sections (P\*) which separate the transverse hollows (C\*) are fitted on one side with a flat and vertical side wall (P1) and on the opposite side with a convex wall (P2) with the convexity turned towards the hollow (C\*).

Each of the convex walls (P2) is made lighter by a pair of notches (P2\*) which extend towards the bottom wall of each hollow (C\*) in order to make the convex wall (P2) elastic enough to snap the ends of the lever (3b) into the hollow (C\*) as required.

## Claims

1) A scrubbing brush fitted with a mouthpiece for fitting the handle with adjustable inclination for cleaning and levelling flooring of any type by means of a sturdy brush produced in thermoplastic resins characterized in that it consists of a sturdy brush (1) produced with a mixture of thermoplastic resins in a rectangular shape with a fairly accentuated front tip, and with numerous blades on the bottom face for cleaning the flooring and fitted under a matching supporting plate (2) moulded with plastic material and having a surface area which is slightly smaller with respect to the brush (1) underneath and having a raised longitudinal profile (2a) at the top, extending from the front end for approximately three quarters of its length, having a hollow in which a comb (2b) is fitted and which is formed by specially shaped alternating transverse hollows (C) and transverse raised sections (P) having a mushroom transverse cross-section and fitted with a longitudinal groove for the purpose of providing these with a certain elasticity; on the supporting plate (2) there is a mouthpiece (3) having a circular section moulded together with the same for fitting a standard handle whose inclination can be adjusted in that it is hinged, and jointed in two points of the underlying plate (2), that is at the end of the raised profile (2a) of the plate (2) and on the section of this raised profile (2b) in which the above comb (2b) is housed.

2) A scrubbing brush fitted with a mouthpiece for the handle with adjustable inclination for cleaning and levelling flooring of any kind by means of a sturdy brush made of thermoplastic resins according to claim 1, characterized in

that the brush (1) is fitted on the bottom with numerous blades of which: some (1a) are arranged peripherally along the three rectilinear sides of the brush, while others (1b) are arranged inside the surface parallel to the longitudinal axis of the same, others (1c) are arranged inside the surface in an orthogonal position to this longitudinal axis and yet others (1d) are arranged on the pointed front edge of the brush, slightly apart with respect to the longitudinal median axis of the brush; the longitudinal blades and the transverse blades are arranged under this brush (1) so that together they cover a continuous surface in two directions; the blades inside the surface of the brush (1) being spaced at a constant distance from one end of the brush (1) to the other, this space being calculated according to the height of the blades so as to prevent that a blade bent by the friction with the flooring, abuts against the adjacent blade placed orthogonally to it, so as to cover the end section completely.

3) A scrubbing brush fitted with a mouthpiece for the handle with adjustable height for cleaning and levelling flooring of any type by means of a sturdy brush made of thermoplastic resin according to the previous claims characterized in that the brush (1) may be fixed permanently to the supporting plate (2) above or with a mobile coupling between these two components using a continuous edge segmented at a certain width running peripherally along the top face of the brush (1) in which the matching peripheral edges of the supporting plate (2) are fitted.

4) A scrubbing brush fitted with a mouthpiece for the handle with adjustable height for cleaning and levelling flooring of any kind by means of a sturdy brush made in thermoplastic resins according to the previous claims characterized in that the mouthpiece (3) and the supporting plate (2) produced in a single moulding operation in plastic materials are coupled in two different points: at the back by means of a bracket (3a) soldered at the base on the back edge of the raised longitudinal profile (2a) of the plate (2) and at the top under the body of the mouthpiece (3), and at the front by means of a lever (3b) soldered at one end on the front of the body of the mouthpiece (3), while the other end which is free and folded slightly downwards, can be housed alternatively by means of a slight pressure into one of the hollows (C) on the comb (2b) fitted along the raised profile (2a) of the supporting plate (2); in the preferred embodiment of the invention, the moulding material of the section where the bracket (3a) is soldered to the plate (2) and the section where the lever (3b) is soldered to the body of the mouthpiece (3), is lighter to realize in both cases a joint or hinge, which combined with the fact that the front end of the lever (3b) can be fitted alternatively in the different hollows (C) of the comb (2b), makes it possible to adjust the inclination of the mouthpiece (3)

and consequently of the handle fitted on the same in different positions with respect to the supporting plate (2).

5) A scrubbing brush fitted with a mouthpiece for the handle with adjustable height for cleaning and levelling flooring of any kind by means of a sturdy brush made in thermoplastic resins according to the previous claims characterized in that in other preferred embodiments of the invention, the comb could be moved directly on the mouthpiece (3), but in this case an end of the lever (3b) would be fixed to the back of the raised profile (2a) of the plate (2) or a double comb could be fitted, one on the profile (2a) of the supporting plate (2) and another on the mouthpiece (3) in which the free ends of a specially designed connection lever

could be fitted.

6) A scrubbing brush fitted with a mouthpiece for a handle with adjustable inclination for cleaning and levelling flooring of any type by means of a sturdy brush made of thermoplastic resins according to claim 1) characterized in that the fixing comb of the free end of the lever (3b) is made in a single piece moulded together with the supporting plate (2) in that in this particular one piece version the comb (2b\*) has transverse raised sections (P\*) fitted on one side with a flat and vertical side wall (P1), and on the opposite side with a convex wall (P2) which is given a certain elasticity by means of a pair of grooves (P2\*) extending towards the bottom wall of each of the hollows (C\*).

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