SPECIFICATION

SURFACE TREATING DEVICE

Technical Field:

The present invention relates to a surface treating device formed by assembling a small number of members having simple configuration, that can be used as a lustering-agent applicator used for lustering car bodies and tires, furniture, etc. as well as a sweeper (a cleaner), an eraser for a blackboard etc., a squeegee for glass etc. or other such device.

Background Art:

A great number of brushes or applicators having a grip to be held by a user have heretofore been proposed. Their major structural feature is that a material such as fur or felt is adhered to a holder portion of the grip by means of an adhesive agent. The brushes or applicators cannot be used until the adhesive agent sets, because the material easily falls out of the holder portion before the adhesive agent sets. Therefore, a step of setting the adhesive agent (allowing it to stand) is required. In addition, the adhesive agent contains an organic solvent that is flammable and harmful to the human body. Therefore, it is necessary to install an exhausting unit and pay strict attention to fire prevention. For these reasons, the productivity thereof is not good.

Various structures using no adhesive agent also have heretofore been proposed.

One example is as shown in Figure 7 in which one end of felt 6 is clamped between a holder portion at the distal end of a grip 7 and a presser plate 8 by means of rivets 9. With this structure, however, it is necessary to form a plurality of through holes for the rivets 9 in the grip 7, presser plate 8 and felt 6, make the grip 7 and presser plate 8 from a hard material and subject the ends of the rivets 9 to welding.

Another example is disclosed in JP-A 11-42193, wherein a wiper cloth is clamped between two members openably connected via a hinge by applying the wiper cloth to the open members and closing the members together. Since this structure is very

complicated, the productivity thereof is not good.

Thus, in the brushes or applicators not using adhesive agent, since the component parts have complicated shapes and the assembling work requires special treatments, the productivity thereof is not good. Moreover, the production cost is too high for use of the brushes or applicators as disposable ones.

On the other hand, the work for lustering car bodies or tires or preventing water drops from adhering to windshields is to coat a treating agent onto a surface to be treated. A car owner has to assemble a set of materials including an applicator such as a spongy member, a treating agent, a container for the treating agent and disposable gloves for carrying out this work. This set is bulky and takes up a large space. If always kept in a car trunk, it is likely to be a nuisance, especially if not frequently.

In recent years, water-drop-adherence preventing devices to solve such a problem have been commercially available. These have a structure such that a cap for a container filled with a treating agent is provided inside with a web member. However, after several uses of such devices, contaminants accumulating in the web member mix with the treating agent, resulting in adherence of stains to windshields coated with the treating agent using the web member.

In view of the above, the present invention has an object to provide a surface treating device that can be fabricated with ease using a small number of members of simple structure and used as a disposable one.

Disclosure of the Invention:

The present invention provides a surface treating device comprising a material of sponge or brush fur that constitutes a treating portion, a plastic holder having a fitting groove, and a pair of plastic plates having inside clamping structures, wherein the pair of plastic plates with one end of the material clamped between the inside clamping structures thereof are forced into and fixed in the fitting groove of the plastic holder.

In this surface treating device, the plastic holder may have a material-fixing portion in which the fitting groove is formed and around which a removable flange extends, and a cover member that comprises a bulged portion for covering the treating portion and a fitting flange joined to the removable flange. The cover member serves to

prevent the volatilization and outflow of a liquid occluded in the material in the storage state of the device and, in use of the device, can be removed together with the removable flange by breaking off the removable flange. Therefore, this surface treating device is very practicable.

As described above, the surface treating device according to the present invention comprises a material constituting a treating portion, a pair of plastic plates and a plastic holder. Since these component members each have a simple structure, the productivity thereof is very high. Furthermore, since these component members can be assembled with ease into a surface treating device without use of adhesive agent or execution of welding treatment, the device productivity is also very practicable.

While special adhesive (easy-to-peel adhesive) has heretofore been adopted between the cup and the cover for various liquid-phase foods, no such adhesive is used in the wet-type surface treating device according to the present invention, that has a liquid occluded in the material constituting the treating portion. High productivity can therefore be attained. The easy-to-peel adhesive used in food containers is required to have both sealability to prevent bleeding of the contained liquid-phase food and an easy-to-peel property of the cover relative to the cup. These two properties are difficult to balance. If one is enhanced, the other tends to degrade. On the other hand, in the present invention, the sealability between the fitting flange and the removable flange is high because the two flanges are joined together, and the cover member can be easily removed by breaking off the removable flange, with the joined section left intact.

Brief Description of the Drawings:

Figure 1 is an exploded front view showing a first embodiment of the surface treating device according to the present invention.

Figure 2 is a cross-sectional side view showing the surface treating device of Figure 1 after fabrication.

Figure 3 is a bottom view showing the surface treating device of Figure 1.

Figure 4 is a perspective view showing the surface treating device of Figure 1 in the state of use.

Figure 5 is a partially sectioned side view showing a second embodiment of the

surface treating device according to the present invention.

Figure 6 is a cross-sectional side view showing a third embodiment of the surface treating device according to the present invention.

Figure 7 is a partially sectioned side view showing a prior art surface treating device.

Figure 8 is a cross-sectional side view showing a comparative example of the surface treating device.

Figure 9 is a cross-sectional side view showing another comparative example of the surface treating device.

Best Mode for Embodying the Invention:

The surface treating device according to the present invention will now be described in detail with reference to the embodiments shown in the drawings.

Figures 1 to 4 illustrate the first embodiment of the surface treating device according to the present invention. The device is a wet-type surface treating device 1 used as an applicator for applying a lustering agent to car tires and equipped with a material 2 that constitutes a treating portion 21, is a soft, continuously foamed body of urethane etc. generally called sponge and occludes a lustering agent (liquid) therein.

The lustering agent applicator 1 fundamentally comprises the material 2, a pair of plastic plates 3 and 3, and a plastic holder 4. Since the lustering agent is occluded in the material 2, as described above, a cover member 5 can be used, when necessary, for covering the material 2 to prevent volatilization and outflow of the lustering agent.

The material 2 constitutes the treating portion 21 brought into contact with a surface to be treated in use of the device, and occludes (stores) liquid therein when used for a wet-type device.

In the illustrated embodiment, the material 2 is sponge as described above. However, this is by no means limitative. The material 2 may be brush fur, cloth or other such material as in other embodiments described later. Otherwise, fiber web, nonwoven fabric or like material can be substituted. Thus, the material is optionally determined. When the material is applied for a wet-type device such as various kinds of applicators, for example, sponge, felt or other such material that can occlude (store) a liquid substance

is used. When the material is applied for a dry-type device such as a brush or a sweeper such as a duster, an eraser (for a blackboard) etc., brush fur, cloth or other such material is used. In addition, the shape of the material is also optional. In the illustrated embodiment, the material is rectangular and has its one end clamped between the plates 3 and 3 to form a substantially semi-cylindrical treating portion 21. The material is not limited to this embodiment and may have any shape.

The pair of plates 3 and 3 are moldings of plastic provided on their respective facing surfaces with a clamping structure 31.

The plates 3 and 3 are thin strip moldings and have on their respective facing surfaces two rows of ridges 31 triangular in cross section. The clamping structure 31 is not limited to the ridges. It may be comprised of a plurality of conical or pyramidal splinters, or of a bump on one of the facing surfaces of the plastic plates 3 and a recess in the other facing surface thereof. Any other form of clamping structure can be adopted. The lateral width L_2 of the lower end of the plastic plates 3 and 3 is set to be slightly larger than the length L_1 of a fitting groove 41 of the holder 4 that will be described later.

The holder 4 is an integral molding of plastic formed with the fitting groove 41 for holding the material 2 (treating portion 21) via the pair of plates and provided with a portion to be gripped (grip portion 42) by the hand in a lustering operation.

In the illustrated embodiment, the holder 4 has the hollow cylindrical grip portion 42 that is provided at one end thereof with a fixing portion 43 substantially rectangular in cross section, whose corners are rounded (having round corners) and which is formed normal to the lengthwise direction of the grip portion 41. The fixing portion 43 is formed with the slender fitting groove 41. The grip portion 42 is formed on the outside surface thereof with nonslip projections 421 and inside thereof with reinforcing ribs 422.

The length L_1 of the fitting groove 41 is slightly shorter than the lateral width L_2 of the lower end of the plastic plates 3 and 3. The surfaces of the fixing portion defining the fitting groove 41 are flat. Since the fitting groove 41 does not have engaging projections 411 and stopper flanges 412 as in comparative examples shown in Figures 8 and 9, the shape thereof is simple and the production thereof is easy.

In addition, a removable flange 44 extends outward from the peripheral surface of the fixing portion 43 of the holder 4.

In the illustrated embodiment, the removable flange 44 is thin and is formed at a position slightly lower than the top surface of the fixing portion 43 and has a shape provided with four round corners similarly to the fixing portion 43. It is provided with four rising tabs 45 directed toward the treating portion 21. The rising tabs 45 are the portions to which the user applies the bulb of a finger to push the rising tab 45 inward in order to snap and remove the removable flange 44. Since the removable flange 44 is thin, in the absence of these rising tabs 45 there is a possibility of the edge of the removable flange 44 biting into the finger bulb and causing pain. The rising tabs 45 further function to regulate the position of the cover member 5 when the cover member 5 and the holder 4 are joined together and, before the use of the surface treating device 1, serve to enhance the strength of the removable flange 44 and protect the cover member 5.

Furthermore, at the proximal end, the removable flange 44 is formed on the obverse and reverse sides thereof with V-shaped notches 46.

At each round corner on the reverse side thereof, it is formed with two V-shaped linear notches 46'. As shown, a fanlike shape is defined at the reverse side of each round corner by an arcuate segment of the V-shaped notch 46 and the two V-shaped linear notches 46'.

The cover member 5 is a member for preventing the volatilization and outflow of a lustering agent occluded in the material 2 as described above and is an integral molding of transparent plastic comprising a bulged portion 51 for covering the treating portion 21 and a fitting flange 52. The fitting flange 52 has substantially the same dimensions as the removable flange 44 of the holder 4.

The surface treating device 1 of the present invention is fabricated by assembling together the material 2 constituting the treating portion, pair of plates 3 and 3, holder 4 and cover member 5 each having a simple structure. This assemblage is easily conducted.

That is to say, the end (the lower end) of the material 2 is clamped between the pair of plates 3 and 3, and the plates in that state are forced into the fitting groove 41 to fix the material 2 integrally to the holder 4.

As explained above, the lower end lateral width L_2 of the plastic plates 3 and 3 is set to be slightly larger by an interference amount than the length L_1 of the fitting groove 41. Therefore, the plates between which the lower end of the material 2 has been clamped are forcibly inserted, i.e. interference-fitted, into the fitting groove 41. After the attachment (insertion) of the plates, the opposite lower side edges of the plates 3 and 3 bite into the inside wall of the fixing portion defining the fitting groove 41, owing to elastic deformation of the plates, thereby attaining firm fixation between the holder and the plates. It is a property of plastic that when elastically deformed plastic is left standing for several days, it creeps into non-restorable plastic deformation. For this reason, mere interference-fitting would result in a decrease in retention force of the holder due to interference amount reduction with the elapse of time. In the present invention, therefore, since the lower portion of the plates 3 and 3 has a projecting shape, when the plates creep, the fitting groove 41 of the holder 4 is deformed into a shape such that the bottom portion 41' thereof is spread while the entrance portion 41" thereof is not spread. This can suppress decrease in the resistance of the plates 3 and 3 in their extraction direction, thereby maintaining large retention force of the holder over a long period of time. Although there is a possibility of the inserted plates 3 and 3 being slightly bent within the fitting groove 41, this will raise no problem because the force of the plates clamping the material 2 becomes larger.

A lustering agent is then occluded in the treating portion 21, and the fitting flange 52 of the cover member 5 and the removable flange 44 are joined together (by welding) or by other such means.

In the surface treating device 1 of the present invention thus fabricated, volatilization or outflow of the lustering agent occluded in the treating portion 21 can be prevented by the cover member 5 when not in use. In operation, the cover member 5 can be easily removed together with the removable flange 44 by snapping off the proximal end (V-shaped notches 46) of the removable flange 44.

To be specific, the user pushes each rising tab 45 formed on the outer periphery of the removable flange 44 inward with a finger bulb. As a result, the removable flange 44 is snapped off at the proximal end V-shaped notches 46. Since the removable flange 44 is disposed at a position slightly lower than the top surface (corner) of the fixing

portion 43, any burrs if formed in consequence of the snapping-off action are at a position lower than the top surface of the fixing portion 43. Further, since the round corners of the removable flange 44 are formed on the reverse side with the V-shaped linear notches 46', these can be snapped off along the arcuate segments of the V-shaped notches 46. Any burrs if formed at the round corners are very small in number and size. Therefore, the finger tip is safe from injury by formed burrs. Thus, safety can be highly ensured.

The cover member 5 can thus be removed into the state of Figure 4. By grasping the grip portion 42 of the holder 4 and bringing the treating portion 21 against an automobile tire, the treating portion 21 is sandwiched between the tire and the fixing portion 43. The lustering agent occluded in the treating portion 21 consequently oozes out and is applied onto the tire surface.

The action of the plates 3 and 3 will be described in detail with reference to the comparative examples of surface treating devices shown in Figures 8 and 9.

The surface treating device of Figure 8 is configured such that each of plates 3a is formed on the outside surface thereof with an engaging recess 32 while the inside wall of a holder 4a defining a fitting groove 41a is formed with a pair of opposite engaging projections 411, whereby the engaging projections 411 engage in the engaging recesses 32. This configuration has a fundamental defect in that a material 2a is susceptible to easy fall-out from between the plates 3a and 3a. In order to avoid such dropout, it is required to greatly increase the compression force of the plates 3a and 3a within the fitting groove 41a relative to the material and make the width dimension of the fitting groove 41a highly precise. Formation of such fitting groove 41a is difficult and insertion of the plates 3a and 3a into such fitting groove 41a is very difficult.

In the surface treating device of Figure 9, since a pair of plates 3b are formed on their face-to-face surfaces with clamping structures 31b, a material 2b is less susceptible to dropout than in the comparative example of Figure 8, and insertion of the plates 3b and 3b into a fitting groove 41b is easier than that in the comparative example of Figure 8. In the comparative example of Figure 9, however, the upper outside surface of each plate 3b is formed with parts 33 to be stopped by stopper flanges 412 formed on the upper wall portion of a holder 4b defining the fitting groove 41b. Therefore, formation of such fitting groove 41b is difficult, similarly to that in the Figure 8

comparative example.

On the other hand, in the surface treating device of the present invention, dropout of the material 2 is prevented by the clamping structures formed on the face-to-face surfaces of the pair of plates 3 and 3, and dropout of the plates 3 and 3 is prevented by setting the lower end lateral width L_2 of the plates to be slightly larger than the length L_1 of the fitting groove 41. Therefore, molding of the plates 3 and the fitting groove 41 is very easy.

That is to say, in the present invention, dropout of the material 2 is prevented by the clamping force of the plates 3 and 3 in the width direction of the fitting groove, and dropout of the plates 3 and 3 is prevented by the spreading force of the plates in the length direction of the fitting groove. Thus, the surface treating device of the present invention differs in structure from the surface treating devices of the comparative examples of Figures 8 and 9 in which the dropout of both the material 2a (2b) and the plates 3a (3b) is prevented by the force in the width direction of the fitting groove. Therefore, the strength of integration of the material 2 and the plates 3 and 3 each relative to the holder 4 in the present invention is much higher than that in the comparative examples. In addition, the plates 3 and 3 and the holder with the fitting groove 41 can be molded with ease. Moreover, the plates 3 and 3 can easily be inserted.

Figure 5 shows the second embodiment of the surface treating device according to the present invention, that is a dry-type surface treating device 1 applied to a handy brush in which a material 2 constituting a treating portion 21 is made of brush fur.

The handy brush 1 has substantially the same structure as the surface treating device in the first embodiment except for the nature of the material 2. Nonsubstantial differences include that a fixing portion 43 of a holder 4 is thinner and that neither the removable flange 44 nor the cover member 5 is provided. The same reference numerals are given to the corresponding members and the description thereof will be omitted.

The assembly into this surface treating device can be achieved by clamping the lower end of the material 2 between a pair of plates 3 and 3 and thrusting the pair of plates in that state into a fitting groove in the holder 4.

Figure 6 shows the third embodiment of the surface treating device according to the present invention, that is a dry-type surface treating device 1 applied to an eraser

(for a blackboard) in which a material 2 constituting a treating portion 21 is cloth.

This eraser 1 has substantially the same structure as the surface treating device in the first embodiment except for the nature of the material and the shape of a grip portion 42, but neither the removable flange 44 nor the cover member 5 is provided. The same reference numerals are given to the corresponding members and the description thereof will be omitted.

The assembly into the surface treating device can be effected in the same manner as in the first and second embodiments, and the material and the holder can be integrally fixed by clamping the lower end of the material 2 between a pair of plates 3 and 3 and thrusting the pair of plates in that state into a fitting groove in the holder 4.

The present invention has been described based on the embodiments shown in the drawings. However, the invention is not limited to the embodiments and can be implemented in any form without changing the scope of the appended claims. Although the lustering agent applicator has been illustrated as a wet-type surface treating device, other wet-type surface treating devices such as a water-drop adherence preventing device for automobile windshields, a broad marker pen (for signboards), etc. can be realized by changing the kind of the material of the treating portion and changing the kind of liquid occluded in the material. As dry-type surface treating devices, a squeegee for windows etc. can be realized by changing the material to hard rubber or the like.

Industrial Applicability:

As has been described in the foregoing, the surface treating device according to the present invention comprises a material constituting a treating portion, a pair of plates and a holder, the structures of which are very simple, resulting in high productivity. In assembling these component members, adhesive agent, welding operation and other such means or operation that have heretofore been adopted are not required. Therefore, no special apparatus or equipment is required, resulting in safety for operators and high practical utility.

When a cover member is adopted for the wet-type surface treating devices having the liquid occluded in the material, since two flanges are joined together, the liquid can be tightly sealed. In use, the removable flange and the cover member can easily be

removed by snapping off the removable flange, with the joined portion left as it is. Therefore, the wet-type surface treating devices can be advantageously used as disposable ones.

Thus, the surface treating device of the present invention can be used in various applications as a lustering agent applicator used in the lustering operation for car bodies or tires, furniture, etc., as well as a sweeper (a cleaner), an eraser for a blackboard etc., a squeegee for glass etc. or other such device.

Scope of Claims

1. A surface treating device comprising a material (2) of sponge, brush fur or other such material that constitutes a treating portion (21), a pair of plastic plates (3) having inside clamping structures (31), and a plastic holder (4) having a fitting groove (41), wherein the pair of plastic plates with one end of the material clamped between the inside clamping structures thereof are forced into and fixed in the fitting groove of the plastic holder.

2. The surface treating device according to claim 1, wherein the treating portion (21) has liquid lustering agent or liquid detergent occluded therein, and the holder has a fixing portion (43) in which the fitting groove (41) is formed and a removable flange (44) that extends outward from a peripheral surface of the fixing portion (43), and further comprising a cover member (5) comprising a bulged portion (51) for covering the treating portion and a fitting flange (52) joined to the removable flange of the holder to prevent volatilization and outflow of the liquid lustering agent or liquid detergent, and wherein the removable flange and the cover member are removable together by snapping off the removable flange in preparation for use.