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(54) **SQUEEGEE HAVING AT LEAST ONE
TAPERED END**

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ABSTRACT

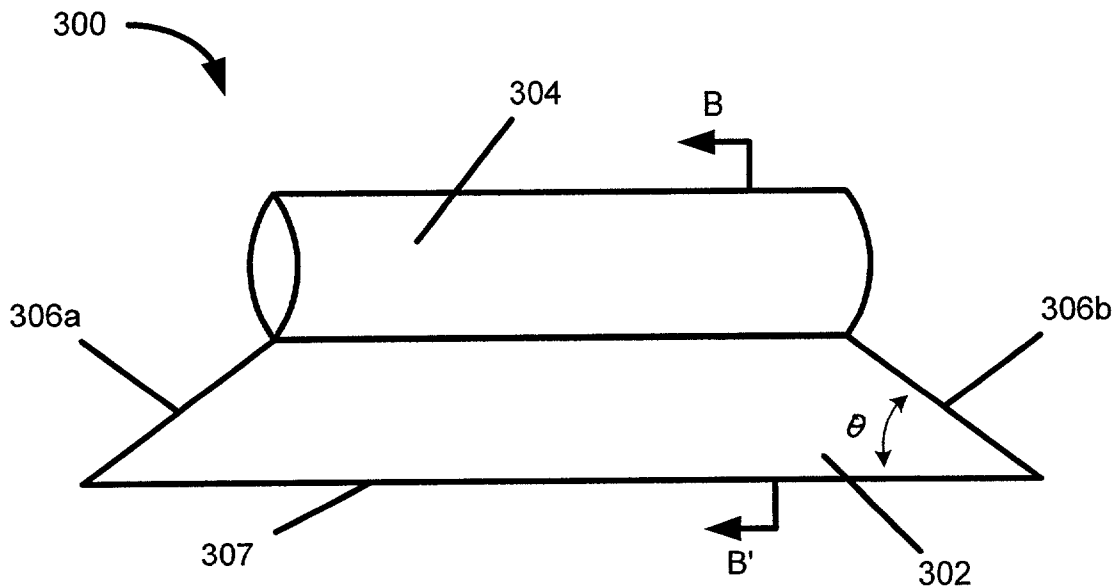
In accordance with one aspect of the invention, a squeegee comprises a flexible blade having at least one cleaning edge and at least one handle edge, wherein at least one end of the blade is tapered outwardly from the handle edge to the cleaning edge. In accordance with another aspect of the invention, a squeegee comprises a flexible blade having at least one cleaning edge and at least one handle edge, wherein at least one end of the blade is tapered outwardly from the handle edge to the cleaning edge, and the cleaning edge of the blade is curved so that the middle portion thereof is higher than at least one end portion thereof.

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(22) Filed: **Oct. 31, 2001**

Related U.S. Application Data

(63) Non-provisional of provisional application No. 60/244,748, filed on Oct. 31, 2000.



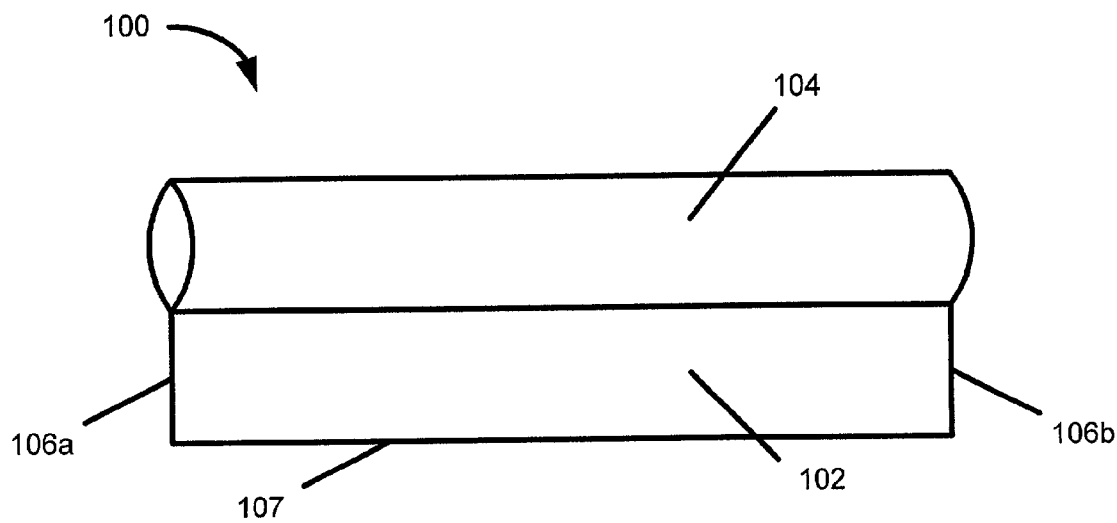


FIG. 1
PRIOR ART

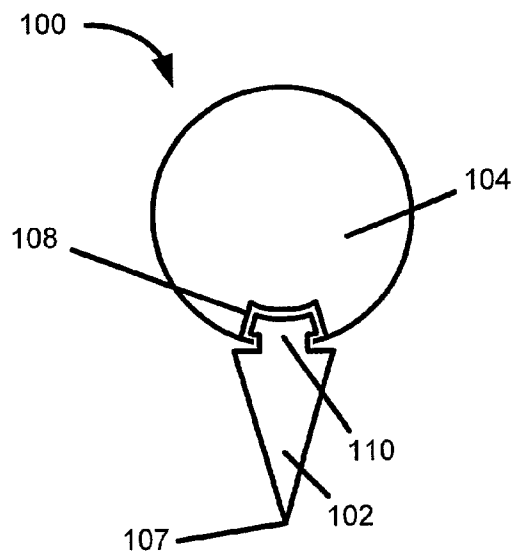


FIG. 2
PRIOR ART

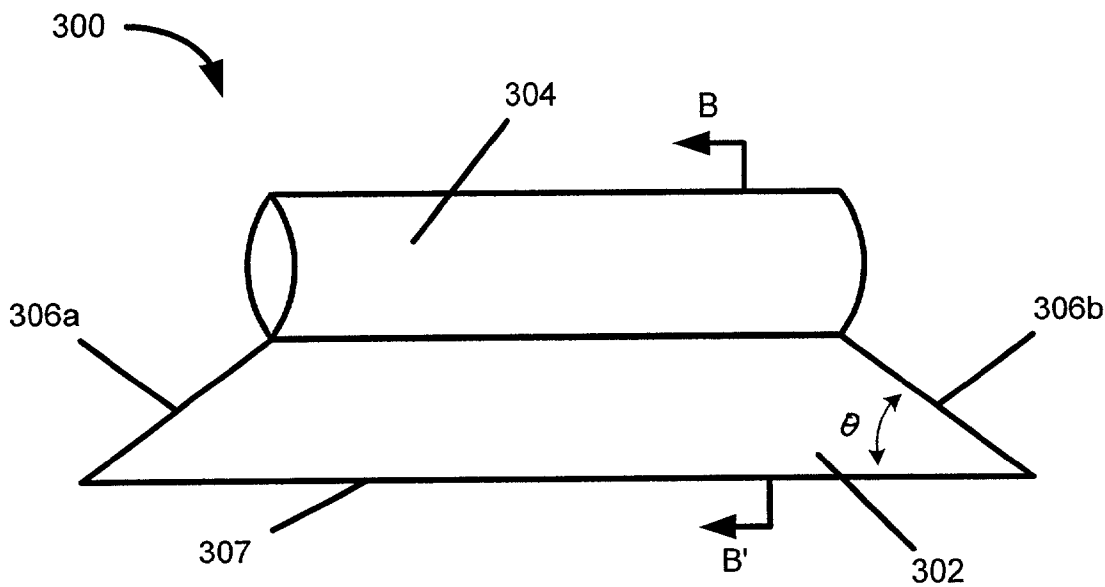


FIG. 3

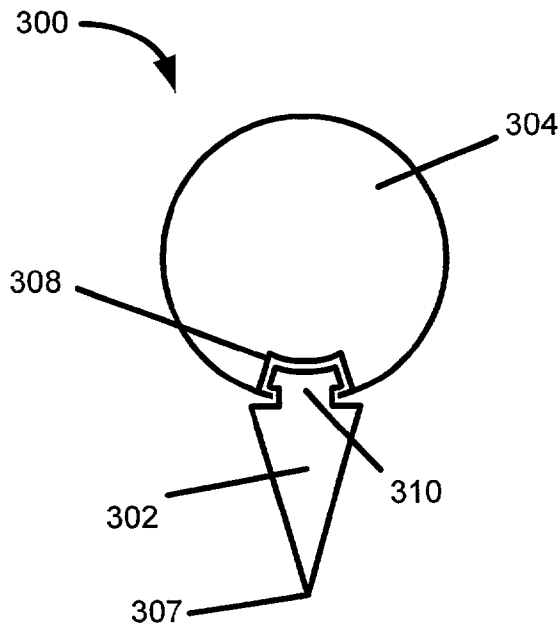
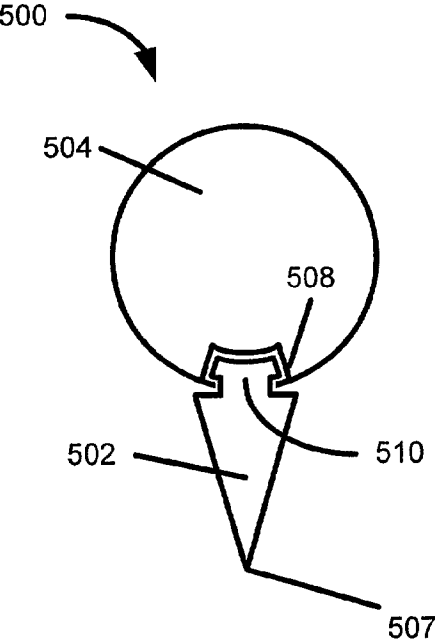
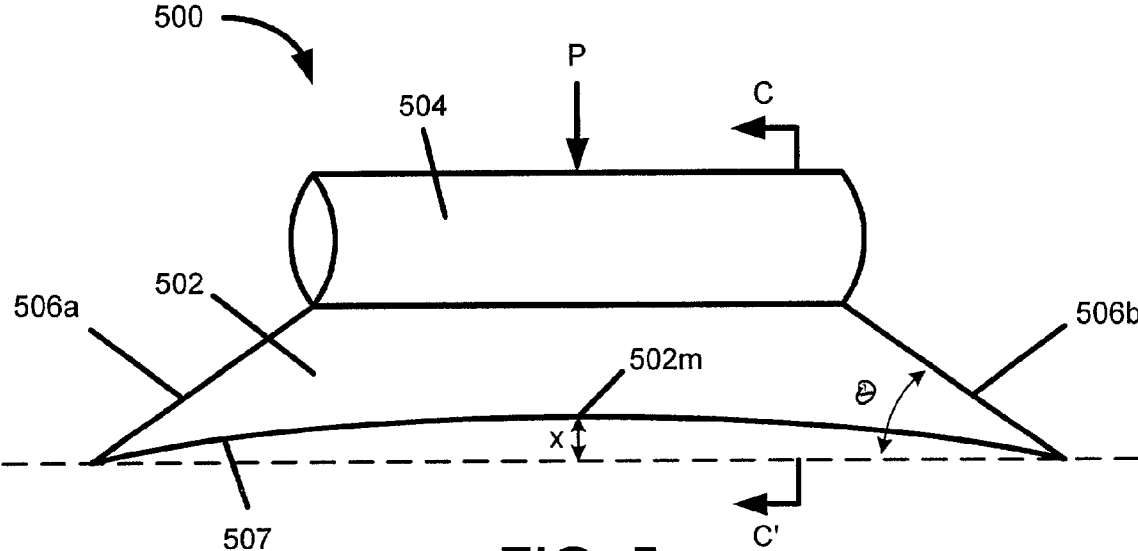


FIG. 4



SQUEEGEE HAVING AT LEAST ONE TAPERED END

RELATED APPLICATION DATA

[0001] This application claims priority to previously filed U.S. Provisional Application No. 60/244,748, filed on Oct. 31, 2000, entitled "Squeegee Having at Least One Tapered End", which is incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

[0002] The invention herein described relates generally to a squeegee for use in cleaning and/or drying a variety of surfaces. More specifically, the invention herein described relates to a squeegee having at least one tapered end which is especially suited for curved or irregular surfaces found on vehicles (e.g., automobiles, boats, trucks, etc.).

BACKGROUND OF THE INVENTION

[0003] Squeegees having a flexible blade made of, for example, rubber or plastic, which is tapered only from the top of the blade (where the blade is mounted in a handle or other suitable object) to the bottom of the blade (the portion which comes into contact with the surface to be cleaned or dried) are known in the art.

[0004] As shown in FIGS. 1 and 2, squeegee 100 has a blade 102 attached to a handle 104. The blade 102 is tapered from top to bottom (see FIG. 2) while the ends 106a and 106b of the blade 102 are perpendicular to the edge 107 of the blade 102. The blade 102 is attached to the handle 104 by inserting a flange 110 at the top end of the blade 102 into a corresponding female shaped channel 108 in the handle 104.

[0005] Such squeegees suffer from at least the problem that when the surface to be cleaned or dried contains one or more irregular surface features (e.g., rounded or angular surfaces, body moldings, ornamental objects, etc.), the user is required to exert additional time and/or effort to accomplish the cleaning or drying task because the above described squeegee suffers from a lack of flexibility.

[0006] Thus, there is a need for a squeegee which can be used to clean and/or dry irregularly shaped surfaces or surfaces which contain one or more irregular objects attached thereto.

SUMMARY OF THE INVENTION

[0007] The present invention is directed to a squeegee which contains one or more physical features which permit the squeegee to have an increased flexibility for use in cleaning and/or drying irregular surfaces.

[0008] In accordance with one aspect of the invention, a squeegee comprises a flexible blade having at least one cleaning edge and at least one handle edge, wherein at least one end of the blade is tapered outwardly from the handle edge to the cleaning edge.

[0009] In accordance with another aspect of the invention, a squeegee comprises a flexible blade having at least one cleaning edge and at least one handle edge, wherein at least one end of the blade is tapered outwardly from the handle edge to the cleaning edge, and the cleaning edge of the blade

is curved so that the middle portion thereof is higher than at least one end portion thereof.

[0010] To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims. These embodiments are indicative, however, of but a few of the various ways in which the principles of the invention may be employed. Other objects, advantages and features of the invention will become apparent from the following detailed description of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 illustrates a conventional squeegee having ends which are perpendicular to the edge of the squeegee blade;

[0012] FIG. 2 is an end view of the squeegee of FIG. 1;

[0013] FIG. 3 illustrates a squeegee according to one embodiment of the present invention;

[0014] FIG. 4 is a cross-sectional view of the squeegee of FIG. 3 along line B-B' of FIG. 3;

[0015] FIG. 5 illustrates a squeegee according to another embodiment of the present invention; and

[0016] FIG. 6 is a cross-sectional view of the squeegee of FIG. 5 along line C-C' of FIG. 5.

DETAILED DESCRIPTION OF THE INVENTION

[0017] The present invention relates to a squeegee having one or more physical features which permit its use in cleaning and/or drying irregular surfaces, surfaces which contain one or more irregular features, and/or compound surfaces and/or contours (i.e., multi-planar or multi-faceted surfaces). Additionally, the squeegee of the present invention is able to maneuver over and/or around obstructions.

[0018] FIGS. 3 and 4 illustrate a squeegee 300 according to one embodiment of the present invention. The squeegee 300 has a blade 302 having at least one edge 307 attached by any appropriate means to a handle 304. For example, blade 302 can be attached to handle 304 via a flange 310 (i.e., a male flange 310) formed at the top end of the blade 302 which is inserted into a corresponding female shaped channel 308 formed in handle 304 (see FIG. 4). In another embodiment, the blade is attached to the handle 304 by any suitable attachment means (e.g., an adhesive; one or more screws, bolts, rivets; an interlocking system; a clamping system; or a combination of two or more thereof, etc).

[0019] In one embodiment, the blade 302 has at least one tapered end. In another embodiment, as illustrated in FIGS. 3 and 4, the blade 302 has two tapered ends. The angle at which the end is tapered is represented by the angle θ . In one embodiment, θ is from about 10 to about 75 degrees, in another embodiment θ is about 30 to about 60 degrees, and in still another embodiment θ is about 35 to about 55 degrees.

[0020] With regard to the blade 302, the material from which the blade is formed is not important so long as the blade retains a degree of flexibility in the at least one tapered end thereof. Therefore, the blade 302 can be formed from any suitable material and in one embodiment the blade is

formed from a flexible rubber or plastic. The at least one tapered end of the blade can be formed by any suitable method. For example, as illustrated in FIG. 3, tapered ends 306a and 306b can be formed by cutting off an appropriately angled portion from one or more non-tapered blade ends using a suitable cutting tool (e.g., a utility knife, a pair of scissors, etc.). In another embodiment, the blade 302 is formed by using a mold having the desired tapered end or ends.

[0021] With regard to the handle 304, the handle 304 can be formed from any suitable material including, but not limited to, wood, plastic, metal, and rubber. In one embodiment, the handle 304 is formed separately from the blade 302, and then the two are attached using any suitable attachment means. In another embodiment, the handle 304 and blade 302 are integrally formed (e.g., extrusion molded as one piece).

[0022] Additionally, due in part to the at least one tapered end, the squeegee 300 of the present invention permits the formation of a squeegee having a longer blade length relative to handle length. This permits the added benefit of a cost savings due to the elimination of a portion of the material necessary to form the squeegee's handle.

[0023] Turning now to FIGS. 5 and 6, the embodiment illustrated in FIGS. 5 and 6 is almost identical to the embodiment illustrated in FIG. 3 and 4. Accordingly, like reference numerals refer to like parts and as such a detailed discussion thereof is omitted.

[0024] The difference between squeegee 300 and squeegee 500 is that squeegee 500 has a blade which is curved from both ends of the blade 502 to the middle 502m thereof. In one embodiment, the amount of curvature in blade 502 is measured in terms of how much higher the middle 502m of blade 502 is than the ends thereof. This amount of curvature in blade 502 is represented by the dashed line and the letter X depicted in FIG. 5.

[0025] In one embodiment, the curvature of blade 502 is from about 0.001 to about 0.1 cm per centimeter of blade length. In other words, if the blade 507 is 30 cm in length then X in FIG. 5 is equal to about 0.03 to about 3 cm. In another embodiment, the curvature of blade 502 is from about 0.01 to about 0.05 cm per centimeter of blade length. In other words, if the blade 507 is 30 cm in length then X in FIG. 5 is equal to about 0.3 to about 1.5 cm. It should be noted that the present invention is not limited to a blade which is only one specific length. Rather, blade 507 can be made to any desired length so long as the curvature thereof falls within the above noted parameters.

[0026] The amount of curvature in blade 502 depends on a number of factors. These include, but are not limited to, the material from which blade 502 is formed, and the use which envisioned for the squeegee. For example, where blade 502 is formed from a more flexible material (e.g., a soft plastic), the curvature of the blade is larger so that when pressure is applied substantially the entire edge of blade 502 comes into contact with the surface to be cleaned and/or dried. Blade 502 can also have a large curvature when the squeegee is designed for use over non-planar or curved surfaces (e.g., automobile fenders, boat hulls, etc.)

[0027] The exact amount of curvature necessary for a given application can be determined by one of ordinary skill

in the art, or can be determined without undue experimentation given the intended use for the squeegee.

[0028] Curving the blade 502 allows the tapered blade ends 506a and 506b to remain in contact with a flat surface when pressure is exerted in the middle of the handle 504 in the direction of arrow P. Increases in the load P cause the ends of the blade 502 to urge or flex upwardly which, in turn, causes the middle 502m of the blade 502 to be drawn close or to contact the surface to be cleaned and/or dried. Once the middle 502m contacts the surface, substantially the entire edge 507 of the blade will be in contact with a flat surface, thereby readying the squeegee for movement across the surface. Such movement can accomplish, among other things, the desired cleaning and/or drying of the surface in question.

[0029] With regard to a non-linear or non-planar surface, the amount of the blade edge 507 which comes into contact with the surface upon the exertion of a load P will vary depending upon any number of factors including, but not limited to, the topography of the surface, any ornamental or other objects thereon, the curvature of the surface, etc.

[0030] Additionally, as can be seen from FIG. 5, the angle θ is measured from the flat surface represented by the dashed line. In another embodiment, the angle θ can be measured from any appropriate portion of the edge 507 of the blade 502 which lies under the tapered end 506a and/or 506b of the blade 502.

[0031] In view of the above, the present invention permits the use of a squeegee over irregular, non-planar or rounded surfaces. It should be noted that when the angle θ is small the tapered ends of the blade are more adapt at conforming to irregular surfaces. On the other hand, when the value of θ is large, the blade is more likely to clean and/or remove water across the complete length of the blade.

[0032] Although the invention has been shown and described with respect to a certain preferred embodiment or embodiments, it is obvious that equivalent alterations and modifications will occur to others skilled in the art upon the reading and understanding of this specification and the annexed drawings. In particular regard to the various functions performed by the above described components (assemblies, devices, etc.), the terms (including any reference to a "means") used to describe such components are intended to correspond, unless otherwise indicated, to any component which performs the specified function of the described component (e.g., that is functionally equivalent), even though not structurally equivalent to the disclosed structure which performs the function in the herein illustrated exemplary embodiments of the invention. In addition, while a particular feature of the invention may have been disclosed with respect to only one of several embodiments, such feature may be combined with one or more other features of the other embodiments as may be desired and advantageous for any given or particular application.

What is claimed is:

1. A squeegee comprising a flexible blade having at least one cleaning edge and at least one handle edge, wherein at least one end of the blade is tapered outwardly from the handle edge to the cleaning edge.

2. The squeegee of claim 1 further comprising a handle, wherein the at least one handle edge of the flexible blade is attached via an attachment means to the handle.

3. The squeegee of claim 2 wherein the attachment means for attaching the at least one handle edge of the flexible to the handle is selected from an adhesive; one or more screws, bolts or rivets; an interlocking system; a clamping system; or a combination of two or more thereof.

4. The squeegee of claim 1 further comprising a handle having a female channel for receiving a corresponding male flange on the at least one handle edge of the flexible blade.

5. The squeegee of claim 1 wherein the angle of the taper of the at least one tapered end of the flexible blade is from about 10 to about 75 degrees when the angle is measured from the cleaning edge to the edge of the taper.

6. The squeegee of claim 1 wherein the angle of the taper of the at least one tapered end of the flexible blade is from about 30 to about 60 degrees when the angle is measured from the cleaning edge to the edge of the taper.

7. The squeegee of claim 1 wherein both ends of the flexible blade are tapered outwardly from the handle edge to the cleaning edge.

8. The squeegee of claim 7 wherein the angles of the tapers of the two tapered ends of the flexible blade are independently from about 10 to about 75 degrees when the angle is measured from the cleaning edge to the edge of each of the tapers.

9. The squeegee of claim 7 wherein the angles of the tapers of the two tapered ends of the flexible blade are independently from about 30 to about 60 degrees when the angle is measured from the cleaning edge to the edge of each of the tapers.

10. The squeegee of claim 2 wherein the handle and the flexible blade are integrally formed.

11. A squeegee comprising a flexible blade having at least one cleaning edge and at least one handle edge, wherein at least one end of the blade is tapered outwardly from the handle edge to the cleaning edge, and the cleaning edge of

the blade is curved so that the middle portion thereof is higher than at least one end portion thereof.

12. The squeegee of claim 11 further comprising a handle, wherein the at least one handle edge of the flexible blade is attached via an attachment means to the handle.

13. The squeegee of claim 12 wherein the attachment means for attaching the at least one handle edge of the flexible to the handle is selected from an adhesive; one or more screws, bolts or rivets; an interlocking system; a clamping system; or a combination of two or more thereof.

14. The squeegee of claim 11 further comprising a handle having a female channel for receiving a corresponding male flange on the at least one handle edge of the flexible blade.

15. The squeegee of claim 11 wherein the angle of the taper of the at least one tapered end of the flexible blade is from about 10 to about 75 degrees when the angle is measured from the cleaning edge to the edge of the taper.

16. The squeegee of claim 11 wherein the angle of the taper of the at least one tapered end of the flexible blade is from about 30 to about 60 degrees when the angle is measured from the cleaning edge to the edge of the taper.

17. The squeegee of claim 11 wherein both ends of the flexible blade are tapered outwardly from the handle edge to the cleaning edge.

18. The squeegee of claim 17 wherein the angles of the tapers of the two tapered ends of the flexible blade are independently from about 10 to about 75 degrees when the angle is measured from the cleaning edge to the edge of each of the tapers.

19. The squeegee of claim 17 wherein the angles of the tapers of the two tapered ends of the flexible blade are independently from about 30 to about 60 degrees when the angle is measured from the cleaning edge to the edge of each of the tapers.

20. The squeegee of claim 12 wherein the handle and the flexible blade are integrally formed.

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