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(54) **SQUEEGEE ASSEMBLY FOR USE IN A FLOOR CLEANING MACHINE**

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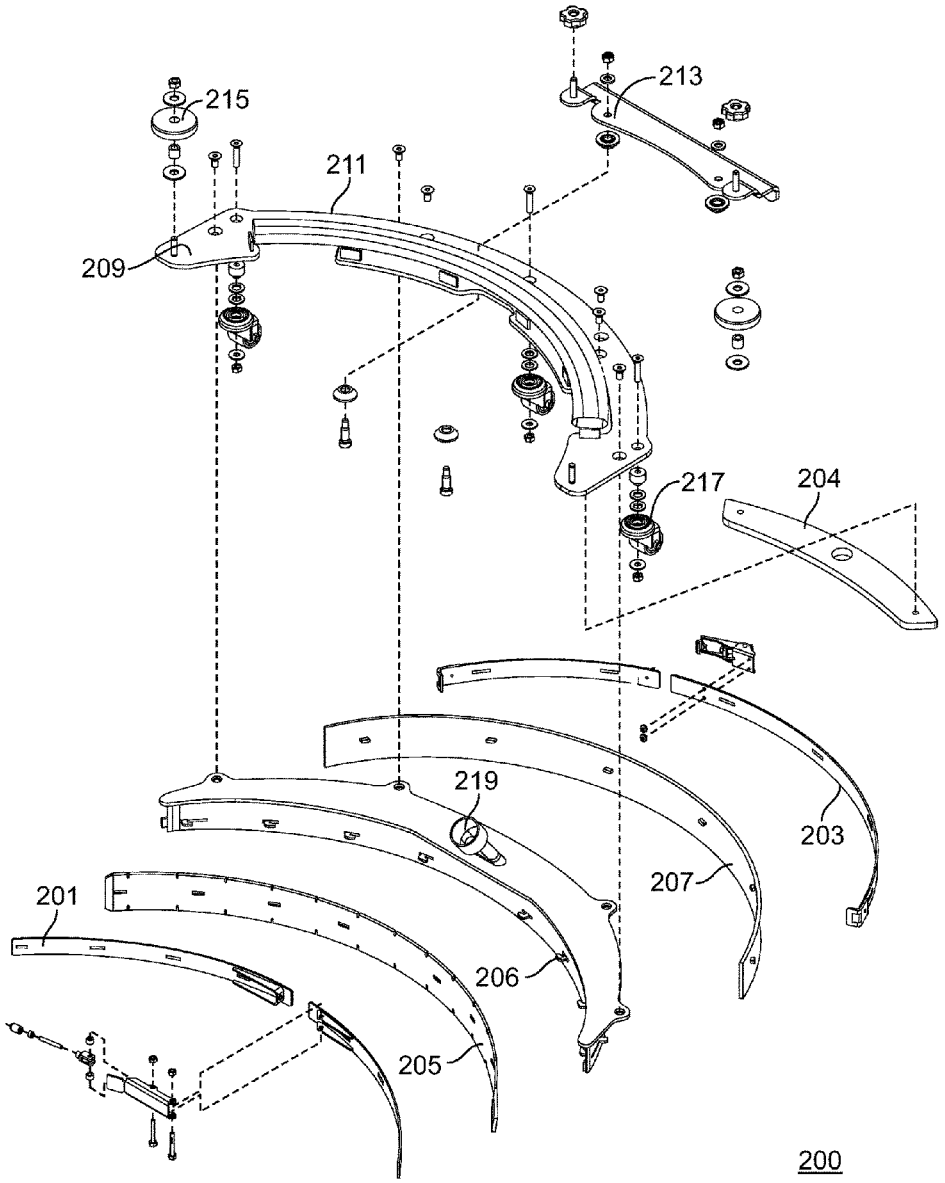
(57) **ABSTRACT**

A squeegee assembly for use with a commercial cleaning machine where one or more squeegee blades work with a curved guide rail and roller mount for allowing the squeegee assembly to cover more floor surface area especially while the cleaning machine is in a turn.



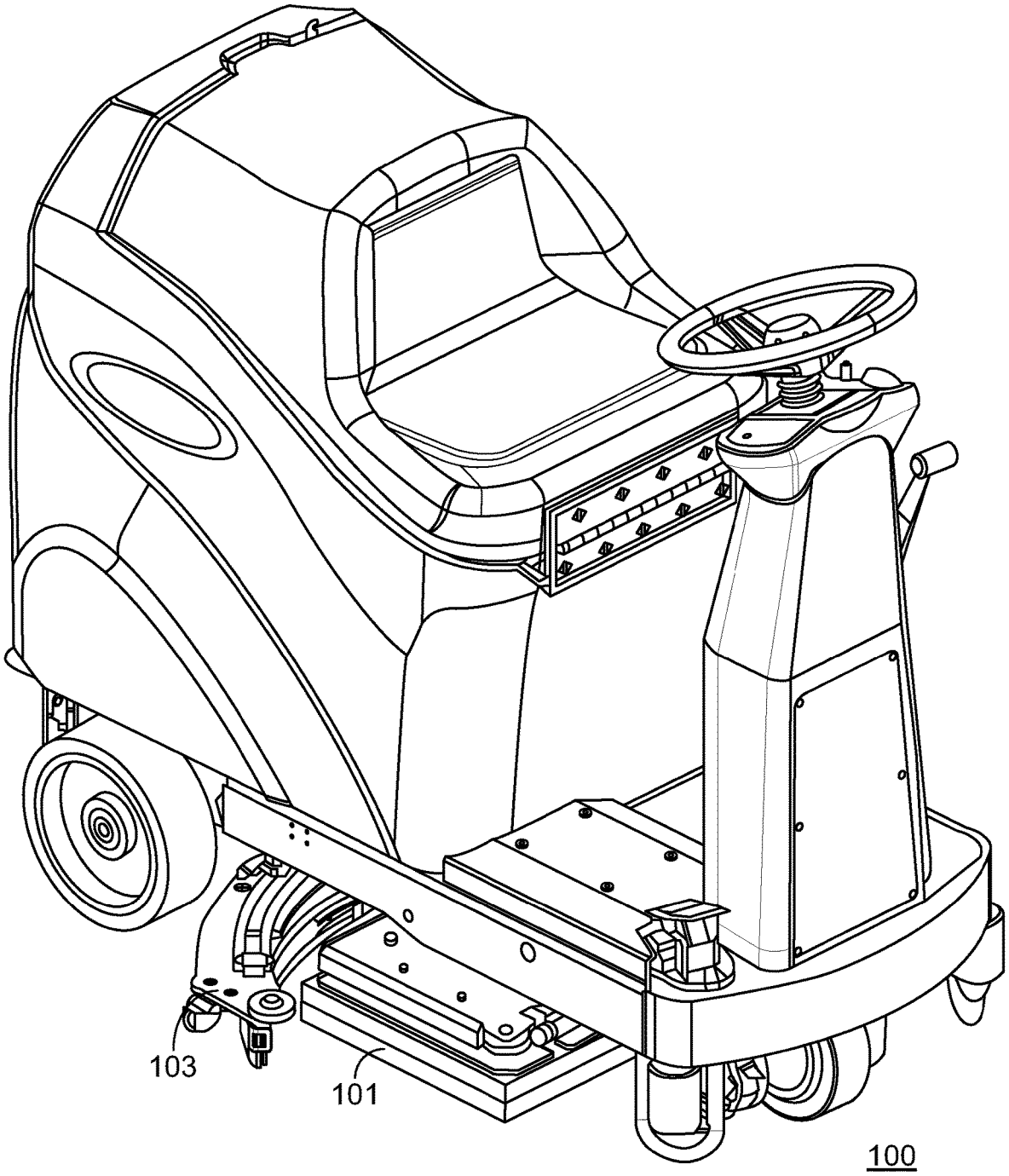



FIG. 1

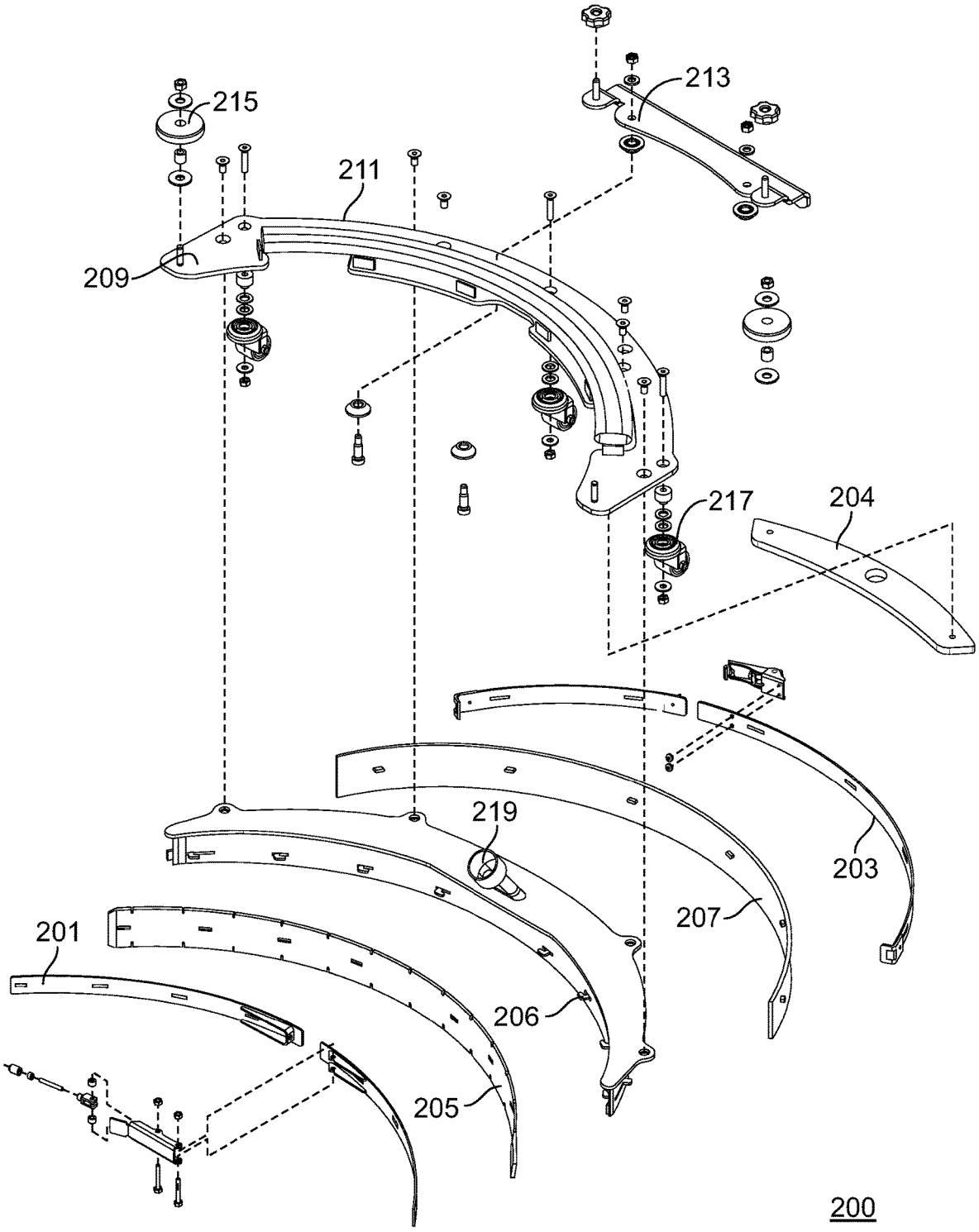



FIG. 2

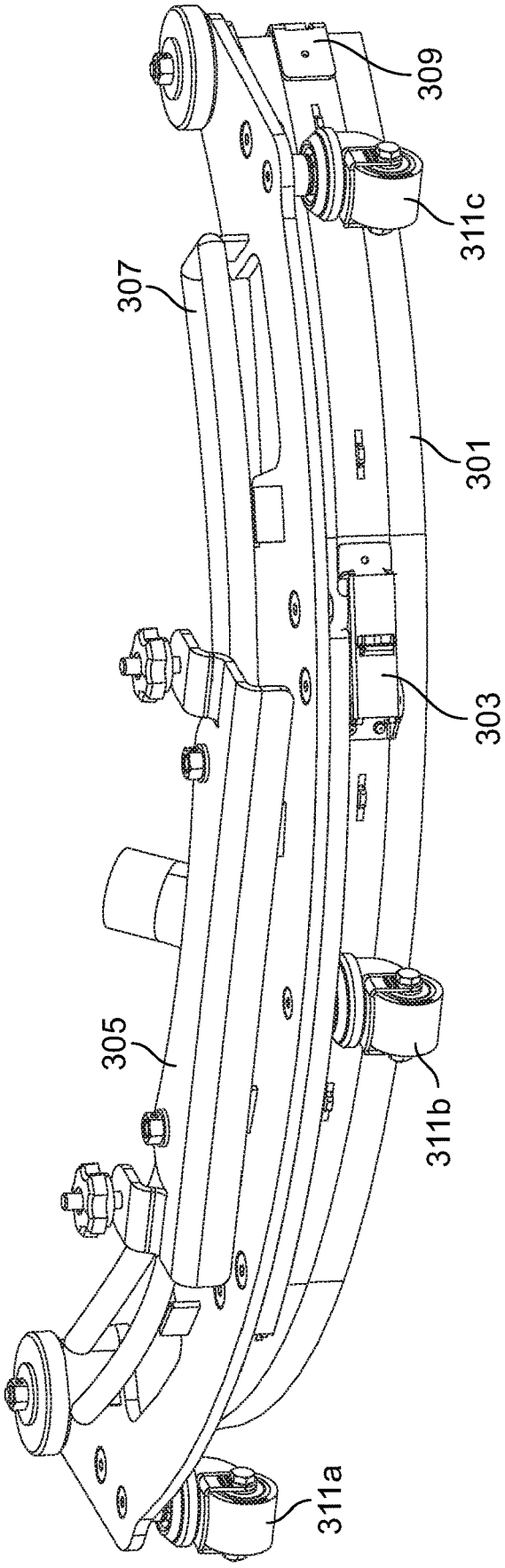



FIG. 3

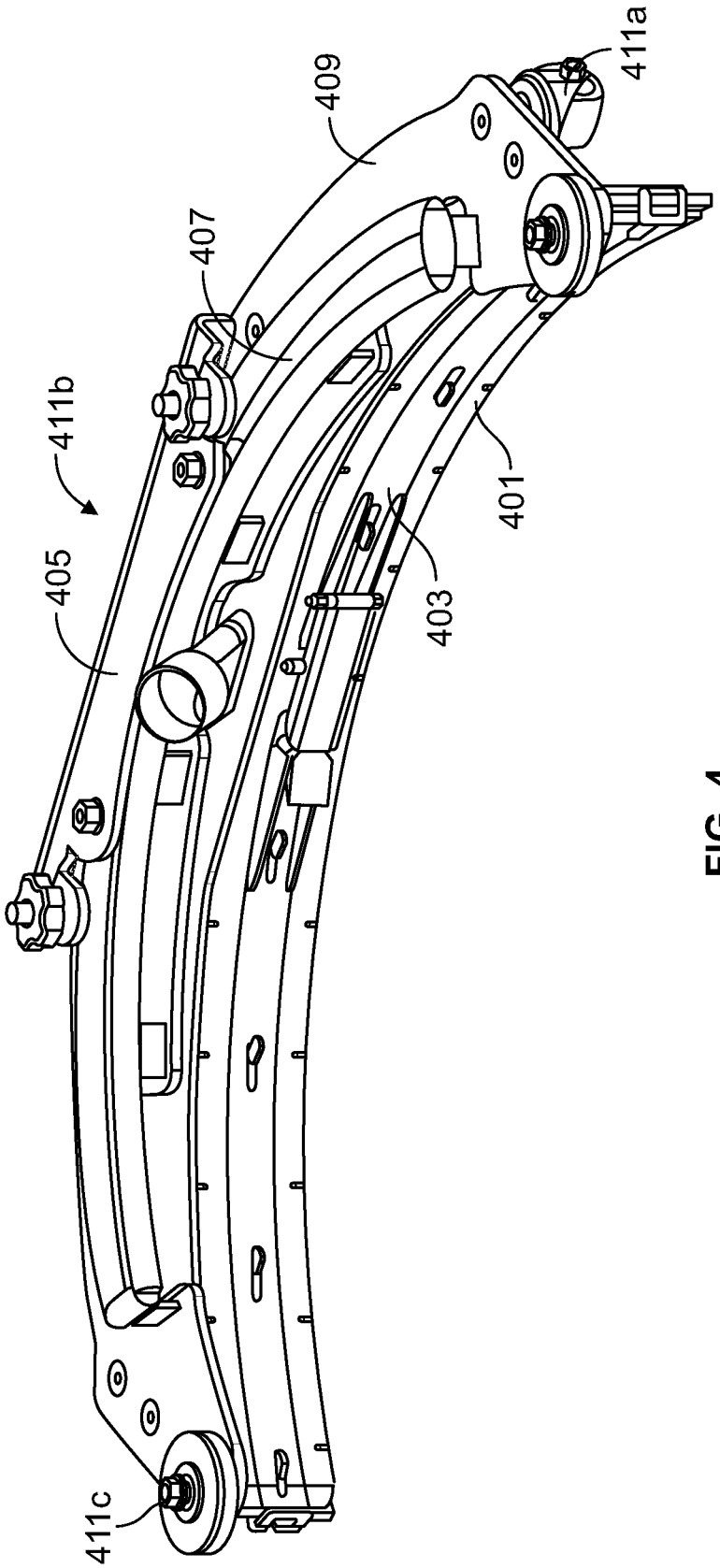



FIG. 4

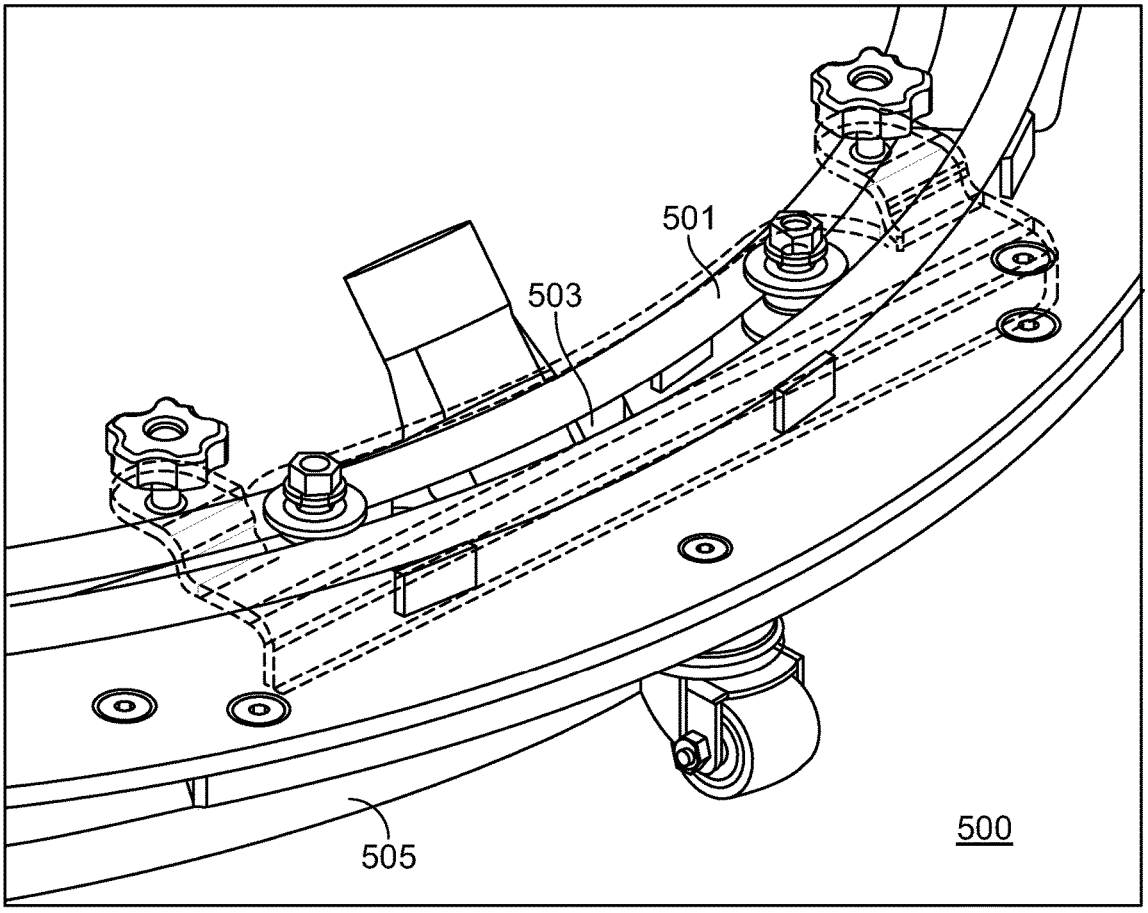



FIG. 5

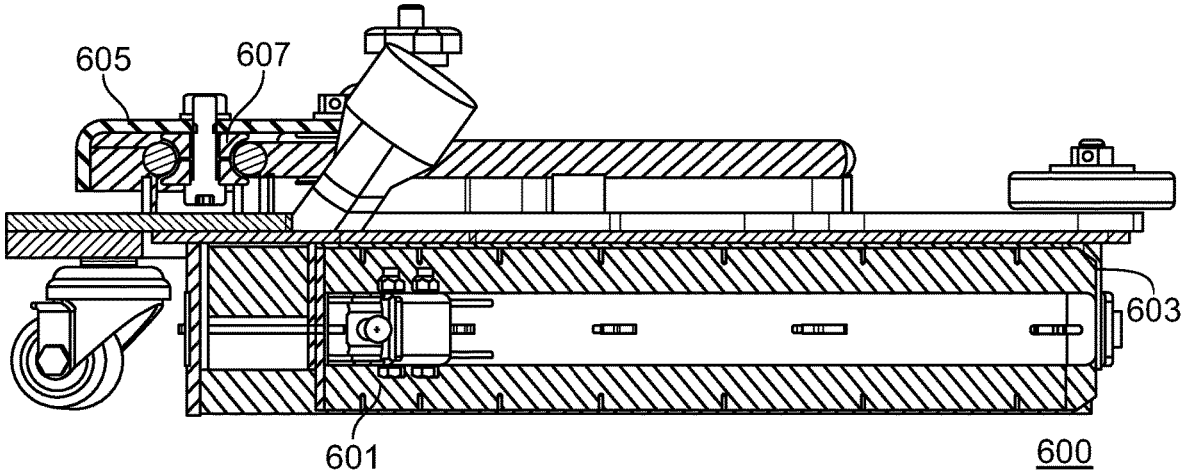



FIG. 6

# SQUEEGEE ASSEMBLY FOR USE IN A FLOOR CLEANING MACHINE

## FIELD OF THE INVENTION

**[0001]** The present invention relates generally to commercial floor cleaning and more particularly to a squeegee assembly for a ride-on commercial floor cleaner.

## BACKGROUND

**[0002]** Commercial ride-on floor scrubbing machines are well known in the art. These machines come in several varieties including that that use rotating disc brushes, rotating cylindrical brushes, and orbital pads. These machines often apply a cleaning solution, such as water or other chemical combinations, to the floor surface. The cleaning solution is applied ahead of the brushes, which helps to loosen and remove dirt, floor finish and/or grime from the floor. A vacuum system is then used with the machine to suction the solution from the floor as the machine passes over the cleaning area. In order to assist the vacuum in removing the water and/or cleaning solution from the floor, a squeegee is configured behind the vacuum nozzle which helps to direct the fluid towards the nozzle while the machine is in motion.

**[0003]** Depending on this configuration, the squeegee sometimes has difficulty in containing and directing all the fluid toward the vacuum nozzle. In practice, the squeegee can only be so wide since it must allow the machine to pass through a 36-in door frame. Moreover, issues can occur when the scrubbing machine does not have side skirts on either side of the scrubbing brushes that further help to contain the fluid under the machine. When the machine is required to make a tight turn to change direction or avoid obstacles, the squeegee must move with the turn in order to prevent excess fluid remaining on the floor—outside of the squeegee's path. Often the squeegee cannot move effectively, hence new solutions are required to make the squeegee more efficient and prevent excess cleaning fluid from remaining on the floor.

## BRIEF DESCRIPTION OF THE FIGURES

**[0004]** The accompanying figures, where like reference numerals refer to identical or functionally similar elements throughout the separate views and which together with the detailed description below are incorporated in and form part of the specification, serve to further illustrate various embodiments and to explain various principles and advantages all in accordance with the present invention.

**[0005]** FIG. **1** illustrates a commercial ride-on orbital floor scrubbing machine using a squeegee according to an embodiment of the invention.

**[0006]** FIG. **2** is an exploded view of the squeegee assembly according to an embodiment of the invention.

**[0007]** FIG. **3** is a rear perspective view of the squeegee assembly.

**[0008]** FIG. **4** is a front perspective view of the squeegee assembly.

**[0009]** FIG. **5** is a magnified view of orbital rail as used in the squeegee assembly.

**[0010]** FIG. **6** is a cross-sectional view of the squeegee assembly.

**[0011]** Skilled artisans will appreciate that elements in the figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example, the dimensions of some of the elements in the figures may be exaggerated relative to other elements to help to improve understanding of embodiments of the present invention.

## DETAILED DESCRIPTION

**[0012]** Before describing in detail embodiments that are in accordance with the present invention, it should be observed that the embodiments reside primarily in combinations of method steps and apparatus components related a squeegee assembly using with a commercial ride-one orbital scrubber. Accordingly, the apparatus components and method steps have been represented where appropriate by conventional symbols in the drawings, showing only those specific details that are pertinent to understanding the embodiments of the present invention so as not to obscure the disclosure with details that will be readily apparent to those of ordinary skill in the art having the benefit of the description herein. Further, it is expected that one of ordinary skill, notwithstanding possibly significant effort and many design choices motivated by, for example, available time, current technology, and economic considerations, when guided by the concepts and principles disclosed herein will be readily capable of generating the inventions as described herein.

**[0013]** FIG. **1** illustrates a ride-on orbital floor scrubbing machine **100** where a scrubbing head **101** is configured adjacent to the floor and a squeegee **103** is configured behind the scrubbing head **101** in order to direct water and/or cleaning fluid into a vacuum system on the machine.

**[0014]** FIG. **2** illustrates an exploded view of the squeegee assembly **200**. The squeegee assembly **200** includes an inner strap **201** and outer strap **203** that work to retain an inner squeegee blade **205** and outer squeegee blade **207**. A squeegee frame **206** works to provide a curved surface for the inner squeegee blade **205**. The squeegee frame **206** also works to provide a curved surface for the outer squeegee blade **207**. The inner squeegee blade **205** and outer squeegee blade **207** both are retained by the inner strap **201** and outer strap **203** in a manner so they both contact the floor surface. A weight **204** is used to provide additional down pressure to the squeegee assembly **200**. The weight **204** is incorporated into a rear center caster **311***b* as described below.

**[0015]** In order for the inner squeegee blade **205** and outer squeegee blade **207** to travel in an accurate motion, a curved rail **209** is used. The curved rail includes a frame having an arced gap or slot **211** where the squeegee frame **206** is mechanically fastened below rail so that it slides within the slot. The motion of the squeegee frame within the slot is facilitated using a roller mount **213** that uses a plurality of rollers **215** that ride in the slot **211**. A plurality of casters **217** are used to allow the rail **209** to easily move across the floor with the inner squeegee blade **205** and outer squeegee blade **207** working to direct water and/or cleaning solution to the vacuum inlet **219**.

**[0016]** FIGS. **3** and **4** illustrate front and rear views respectively of the squeegee assembly **300**, **400**. The outer squeegee blade **301** and inner squeegee blade **401** are shown illustrated below the inner strap **403** and outer strap **303**. Rail roller mount **305**, **405** allows the squeegee assembly **300** to move with the slot **307**, **407** in the orbital rail **309** **409**. A plurality of casters **311***a*, **311***b*, **311***c*, **411***a*, **411***b*, **411***c* allow the squeegee assembly **300**, **400** to easily move across the floor surface with the orbital scrubbing machine. Those skilled in the art will also recognize that the squeegee

assembly **300**, **400** could be used with a cylindrical and/or disc scrubber but in this instance is used to remove side skits from an orbital scrubber.

**[0017]** FIG. **5** is a magnified view of the orbital rail **500**. As seen in the figure the roller mount **501** rides in the slot **503** for facilitating movement of the inner squeegee and outer squeegee **505** assembly.

**[0018]** FIG. **6** is a cross-sectional view of the squeegee assembly **600** showing inner squeegee blade **601** and outer squeegeed blade **603** in the squeegee assembly connected to the roller mount **605** that is movable within the slot **607**. This allows the squeegee assembly to move through approximately 150 degrees of arc allowing the squeegee to capture water and/or floor cleaning solution on the floor when the floor machine enters a turn.

**[0019]** Thus, embodiments of the present invention are directed to a squeegee assembly for use with use with a commercial cleaning machine that uses one or more squeegee blades attached to a frame. A roller is connected to the frame where an orbital rail for guides the roller mount within a slot in the rail though at least 150 degrees of arc so that the blades can capture at water and cleaning residue on the floor while the cleaning machine enters a sharp turn.

**[0020]** The squeegee assembly as described herein, allows for the elimination of side skirts that typically mount on the sides of a scrub head (Orbital, Disc, or cylindrical). Since side skirts can be problematic and work to contain the fluid from the scrub head so that a squeegee system can contain the fluid—especially when the cleaning machine is making turns. With the present invention, fluid can be contained that is left behind from the scrub head without the use of side skirts. The use of a curved rail assembly allows the squeegee to swing further left and right when making turns that a traditional squeegee system would require side skirts. Moreover, when side skits are eliminated, the squeegee would need to get wider to allow fluid pickup in a turn. The present invention enables fluid to be picked-up or removed from the floor surface that remains behind the scrub head without having to make the squeegee assembly wider. This allows the machine to travel though doorways without having to remove the squeegee assembly. Finally, unlike other machines, the invention allows the squeegee to function independently of the scrub head.

**[0021]** In the foregoing specification, specific embodiments of the present invention have been described. However, one of ordinary skill in the art appreciates that various modifications and changes can be made without departing from the scope of the present invention as set forth in the claims below. Accordingly, the specification and figures are to be regarded in an illustrative rather than a restrictive sense, and all such modifications are intended to be included within the scope of present invention. The benefits, advantages, solutions to problems, and any element(s) that may cause any benefit, advantage, or solution to occur or become more pronounced are not to be construed as a critical, required, or essential features or elements of any or all the claims. The invention is defined solely by the appended claims including any amendments made during the pendency of this application and all equivalents of those claims as issued.

We claim:

**1**. A squeegee assembly for use with use with a commercial cleaning machine comprising:

at least one squeegee blade attached to a frame;

a roller mount connected to the frame; and

a curved rail for guiding the roller mount within a slot in the curved rail so the roller mount moves in an accurate motion.

**2**. A squeegee assembly as in claim **1**, wherein the at least on squeegee blade includes an inner squeegee blade and an outer squeegee blade configured on a front side and back side of the curved rail.

**3**. A squeegee assembly as in claim **1**, wherein the roller mount uses a plurality of rollers for facilitating movement within the slot.

**4**. A squeegee assembly as in claim **1**, wherein the orbital rail includes a frame having arced slot such that the frame is mechanically fastened below the rail so that it slides within the slot.

**5**. A squeegee assembly as in claim **1**, further comprising:

a plurality of casters for allowing the squeegee assembly to easily move across a floor surface.

**6**. A squeegee assembly for use in a commercial floor cleaning machine comprising:

a curved rail;

an inner squeegee blade configured inside the curved rail;

an outer squeegee blade configured outside the curved rail;

a roller mount connected to a frame; and

wherein the inner squeegee blade and outer squeegee blade connect to the frame such that the orbital rail guides the roller mount within a slot in the curved rail, moving the inner squeegee blade and outer squeegee blade in an accurate motion for removing moisture from a floor surface while the cleaning machine is in a turn.

**7**. A squeegee assembly as in claim **6**, wherein the orbital rail includes an upper rail that include the slot and a lower rail for holding the inner squeegee blade and outer squeegee blade.

**8**. A squeegee assembly as in claim **6**, further comprising at least one strap for holding the inner squeegee blade and outer squeegee blade to the orbital rail.

**9**. A squeegee assembly as in claim **8**, where the at least one strap include an inner strap and outer strap.

**10**. A squeegee assembly as in claim **6**, wherein the inner squeegee blade and outer squeegee blade are curved in shape.

**11**. A method of forming a squeegee assembly for use in a floor cleaning machine comprising the steps of:

attaching at least one squeegee blade to a frame;

attaching the frame to a roller mount; and

utilizing the roller mount with a curved guide rail for allowing the at least one squeegee to move in an accurate slot in the guide rail to capture fluid on the surface of a floor when the floor cleaning machine is in a turn.

**12**. A method for forming a squeegee assembly as in claim **11**, further comprising the step of:

configuring an inner squeegee blade and an outer squeegee blade on opposite sides of the orbital rail.

**13**. A method for forming a squeegee assembly as in claim **11**, further comprising the step of:

facilitating movement of the curved guide rail within the slot using a plurality of rollers.

**14**. A method for forming a squeegee assembly as in claim **11**, further comprising the step of:

fastening the frame below the orbital guide rail so that it slides within the slot.

**15**. A method for forming a squeegee assembly as in claim **11**, further comprising the step of:

moving the squeegee assembly across a floor surface using a plurality of casters.

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