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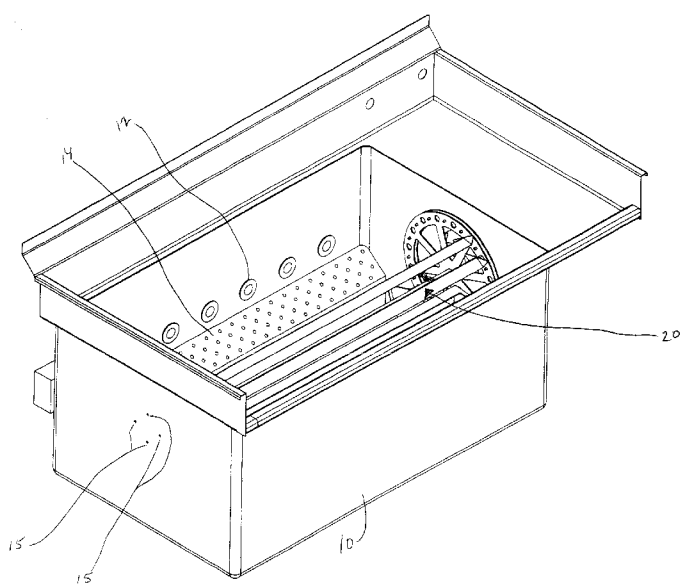
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(54) Title: ROTISSERIE SKEWER, BASKET AND PARTS CLEANING ASSEMBLY



(57) Abstract: A rotisserie skewer, basket and parts cleaning assembly is provided. The assembly is located within a wash tank that includes a jet nozzle to expel a stream of fluid into said wash tank. The assembly is rotatably mounted within the wash tank and is capable of holding parts for cleaning.

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ROTISSERIE SKEWER, BASKET AND PARTS CLEANING ASSEMBLY**Cross-Reference to Related Applications**

[0001] This application claims priority pursuant to U.S. Provisional Patent Application Serial No. 60/886,870, filed January 26, 2007, and U.S. Patent Application Serial No. 12/020,223, filed January 25, 2008, the entire disclosures of which are incorporated herein by reference.

Field of the Invention

[0002] The present invention relates generally to improvements in a pot and pan washing machine. More specifically, the present invention is concerned with a system and method for cleaning parts, such as skewers, baskets or other long parts, in a pot and pan washing machine and a cleaning assembly for cleaning parts within a wash tank of a pot and pan washing machine.

Background of the Invention

[0003] Pot and pan washing machines, of the type used in restaurants, institutions and other facilities often involve a large wash tank or basin in which water is circulated about the pots and pans to provide a washing action. One such machine is described in U.S. Pat. No. 4,773,436 issued to Cantrell et al., the specification of which is incorporated herein by reference. The machine of Cantrell includes a wash tank with multiple jets spaced apart at an elevated position along a wall of the wash tank. The tank is filled with water to a level above the position of the jets. Pots and pans are placed in the wash tank, and a pump is activated to draw water from within the wash tank and direct it through the jets to create a jet stream. Each jet directs its jet stream toward the bottom wall of the wash tank, the bottom wall then deflects the jet stream upward and towards the front wall of the tank. The front wall then deflects the upward moving jet stream towards the rear wall of the tank, and the rear wall deflects the jet stream downward

and back towards the front wall along the bottom wall. The combination of deflections of the jet stream from the bottom, front and rear walls provides a rolling washing action within the wash tank.

[0004] The inventions disclosed in U.S. Pat. Nos. 6,739,348; 6,976,496; 7,162,788; and 7,246,624, the entire disclosures of which are incorporated herein by reference, provide a number of improvements to machines such as disclosed in U.S. Pat. No. 4,773,436. Nevertheless, loading, unloading and cleaning of long parts such as skewers and baskets of motorized commercial rotisserie cookers (such as chicken rotisserie cookers used in restaurants and commercial kitchens) is often difficult due to the size and shape of those items. Therefore, it is desirable to provide a system and method of cleaning such items, that adequately cleans all surfaces of the items and that allows for easy loading and unloading of the items from the washing machine.

Summary of the Invention

[0005] An object of the instant invention is to provide a system and method for cleaning parts, such as rotisserie skewers, baskets and/or other parts, in a washing machine. Another object of the invention is to provide an assembly for cleaning long parts, such as rotisserie skewers, baskets and/or other parts, in a washing machine. Another object of the invention is to provide a system and method of cleaning parts that allows for easy loading and unloading of the parts into a pot and pan washing machine tank. Another object of the invention is to provide a system and method of cleaning parts where the wash tank may additionally be used for scrapping, pre-rinsing, and/or final rinsing, thereby reducing the overall footprint of the machine by eliminating the need for separate scrapping and/or rinsing basins or areas. Another object of the invention is to provide a system for cleaning parts that reduces the upward splashing of

cleaning fluid and/or reduces the risk of injury to bystanders and nearby objects caused by moving parts of the system.

[0006] The above objects of the instant invention are accomplished through a rotating assembly that is located within a wash tank of a pot and pan washing machine. In a preferred embodiment, the wash tank is the wash tank portion of a pot and pan washing machine similar to that described in any of U.S. Pat. Nos. 4,773,436; 6,739,348; 6,976,496; 7,162,788; or 7,246,624. Nevertheless, it will be appreciated that other wash tanks and washing machines, or various combinations of wash tank components, could be utilized without departing from the spirit and scope of the instant invention.

[0007] The present invention comprises a system and method for cleaning parts in a washing machine and a cleaning assembly for cleaning parts within a wash tank of a washing machine. The system comprises a wash tank, at least one jet nozzle, and a cleaning assembly. The wash tank includes a bottom wall, a rear wall, a front wall and two side walls extending generally upwardly from the bottom wall. The jet nozzle(s) expel a stream of fluid into the wash tank. The cleaning assembly is rotatably mounted within the wash tank. The cleaning assembly is capable of holding parts, such as skewers, baskets and/or other parts, for cleaning. At least a portion of the cleaning assembly is located within the stream of fluid expelled by the jet nozzle(s). In a preferred embodiment, the jet nozzle(s) are located along the rear wall of the wash tank. In another preferred embodiment, the cleaning assembly is situated such that it passively rotates due to the stream of fluid expelled by the jet nozzle(s). In another preferred embodiment, the cleaning assembly is attached to the inside of the wash tank such that, when the wash tank is filled with cleaning solution, the cleaning assembly is partially submerged. In still another preferred embodiment, the cleaning assembly of the instant invention further includes a

lid covering at least a portion of the cleaning assembly. In preferred embodiments, the system includes a safety switch to stop the operation of the system when the lid is in any position other than the closed position.

[0008] In a preferred embodiment of the instant invention, the system also includes a scrapping/rinsing rack. The rack is located along the front wall of the wash tank and, in a preferred embodiment includes a plurality of holes to allow fluid to flow into the rack from the tank and drain out of the rack into the tank. In preferred embodiments, the rack includes a plurality of support structures sized and shaped to receive skewers, baskets and/or other parts. In another preferred embodiment, the rack is removable from the system.

[0009] The method for cleaning parts in a washing machine comprises inserting a part into a cleaning assembly, locating the cleaning assembly in a wash tank containing a cleaning fluid, directing a stream of cleaning fluid at the cleaning assembly, and rotating the cleaning assembly. The rotation of the cleaning assembly in a preferred embodiment of the method is accomplished passively by the force exerted upon the cleaning assembly by the stream of fluid directed at the cleaning assembly. In an alternative embodiment, the rotation of the cleaning assembly is accomplished by a motor or other suitable power mechanism attached to the cleaning assembly.

[0010] The foregoing and other objects are intended to be illustrative of the invention and are not meant in a limiting sense. Many possible embodiments of the invention may be made and will be readily evident upon a study of the following specification and accompanying drawings comprising a part thereof. Various features and subcombinations of the invention may be employed without reference to other features and subcombinations. Other objects and advantages of this invention will become apparent from the following description taken in

connection with the accompanying drawings, wherein it is set forth by way of illustration and example, an embodiment of this invention and various features thereof.

Brief Description of the Drawings

[0011] Preferred embodiments of the invention, illustrative of the best modes in which the applicant has contemplated applying the principles, are set forth in the following description and is shown in the drawings and is particularly and distinctly pointed out and set forth in the appended claims.

[0012] Figure 1 shows a perspective view of a system of the instant invention including a wash tank, jet nozzles and parts cleaning assembly.

[0013] Figure 2 shows a detailed perspective view of the parts cleaning assembly of Fig. 1.

[0014] Figure 3 shows a detailed perspective view of a retainer assembly that is mounted to the retainer wheel assembly portion of the parts cleaning assembly of Fig. 1.

[0015] Figure 4 shows an exploded perspective view of the parts cleaning assembly of Fig. 1.

[0016] Figure 5 shows perspective view of another system of the instant invention including a lid and a scrap/rinse rack in an open position.

[0017] Figure 6 shows a perspective view of the system of Figure 5 including a lid and a scrap/rinse rack in a closed position.

Detailed Description of a Preferred Embodiment

[0018] As required, several detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the principles of the invention, which may be embodied in various forms. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present invention in virtually any appropriately detailed structure.

[0019] Referring to Fig. 1, a system of the instant invention is shown. The system comprises a wash tank **10**, jet nozzles **12**, intake assembly **14**, and a cleaning assembly **20**. The wash tank **10** includes a bottom wall, a rear wall, a front wall and two side walls extending upwardly from the bottom wall. The jet nozzles **12** expel a stream of fluid into the wash tank **10**. The cleaning assembly **20** is rotatably mounted within the wash tank **10**. The cleaning assembly **20** is capable of holding parts for cleaning, such as baskets **30** and/or skewers **40**, as shown in Figs. 5-7. At least a portion of the cleaning assembly **20** is located within the stream of fluid expelled by the jet nozzles **12**. In the embodiment shown in Fig. 1, the jet nozzles **12** are located along the rear wall of the wash tank **10**. The cleaning assembly **20** is situated such that it passively rotates due to the stream of fluid expelled by the jet nozzles **12**. The cleaning assembly **20** is attached to the inside of the wash tank **10** such that, when the wash tank **10** is filled with cleaning solution, the cleaning assembly **20** is partially submerged.

[0020] Referring to Figs. 5 and 6, additional embodiments of the instant invention are shown. The system of such embodiments further includes a lid **50** covering at least a portion of the wash tank **10**. In the embodiment shown in Figs. 5 and 6, lid **50** covers cleaning assembly **20**. In a preferred embodiment, the system includes a safety switch (not shown) to stop the

operation of the system when the lid **50** is in any position other than the closed position. The system of Fig. 5 shows the lid **50** in an open position. The system of Fig. 6 shows the lid **50** in a closed position.

[0021] The system shown in Figs. 5 and 6 also includes a scrap/rinse rack **60**. The rack **60** is located along the front wall of the wash tank **10** and includes a plurality of holes to allow fluid to flow into the rack **60** from the tank and drain out of the rack **60** into the tank. It will be appreciated that alternative structures for the rack may be utilized without departing from the spirit and scope of the instant invention. For example, in an alternative embodiment, the scrap/rinse rack is constructed of an open framework (as opposed to the plurality of holes through a bottom wall) to allow fluid to flow into and out of the rack. In preferred embodiments, rack **60** also includes a plurality of support structures **62** sized and shaped to receive skewers, baskets and other parts. The support structures **62** provide stability/support for holding the various parts during scrapping and/or rinsing of those parts. In a preferred embodiment, the rack **60** is removable from the system. The system of Fig. 5 shows both the rack **60** and lid **50** in an open position. The system of Fig. 6 shows both the rack **60** and lid **50** in a closed position. In the embodiment shown in Figs. 5 and 6, lid **50** and rack **60** are rotatably mounted to the inside of wash tank **10** via bearings similar to bearings **26** and **26'** discussed in further detail below. Nevertheless, it will be appreciated that alternative mounting structures for lid **50** and rack **60** may be utilized without departing from the spirit and scope of the instant invention.

[0022] Referring to Fig. 2 and 4, the cleaning assembly **20** is shown in more detail. The cleaning assembly comprises a central shaft **22**, a retainer wheel assembly **24**, and a slip wheel assembly **28**. The retainer wheel assembly **24** is connected to one end of the central shaft **22** and the slip wheel assembly **28** is connected to the other end of the central shaft **22**. In a preferred

embodiment, the slip wheel assembly **28** comprises at least one ring with a plurality of holes. Each of the holes are aligned in parallel to the long axis of the central shaft **22**.

[0023] In one embodiment, the retainer wheel assembly **24** and the slip wheel assembly **28** are fixedly connected to their respective ends of the central shaft **22**. Either one of the retainer wheel assembly **24** or the slip wheel assembly **28** is, preferably both are, fixedly connected to its respective end of the central shaft **22** by aligning a hole in the retainer wheel assembly **24** or the slip wheel assembly **28**, preferably both, with a hole in the respective end of the central shaft **22** and inserting a cotter pin or hitch pin, **24'** and **28'** respectively, through the aligned holes as shown in Fig. 4. The central shaft **22** extends through the center of the retainer wheel assembly **24** to a first bearing **26** and, in the opposite direction, through the center of the slip wheel assembly **28** to a second bearing **26'**. One, preferably both, of these two bearings, **26** and **26'**, is further comprised of a groove for receiving the central shaft **22** such that the central shaft **22** is capable of rotating passively about its long axis, while the cleaning assembly **20** is capable of being separated from the bearings **26** and **26'** by sliding the ends of the central shaft **22** along the respective grooves of the bearings **26** and **26'**. The grooves are comprised of concave surfaces such that they are self-draining of fluid. Once retainer wheel assembly **24** and slip wheel assembly **28** are attached to shaft **22** with the cotter pin or hitch pin as described above, the assembly is placed within grooves of bearings **26** and **26'**. Bearings **26** and **26'** are attached to wash tank **10** using sealing bolts (such as for example hex bolts with an o-ring) that extend through holes **15** in wash tank **10**. It will be appreciated that alternative structures and arrangements of retainer wheel assembly **24** and slip wheel assembly **28** may be utilized without departing from the spirit and scope of the instant invention. For example, in one alternative embodiment, retainer wheel assembly **24** and slip wheel assembly **28** are each mounted to

opposing end/side walls of wash tank **10** without the inclusion of central shaft **22**, such that retainer wheel assembly **24** and slip wheel assembly **28** each rotate independently of one another.

[0024] In the embodiment shown in Figs. 2 and 4, the slip wheel assembly **28** is comprised of two rings that are fixedly connected together. One ring is comprised of a plurality of hexagonal-shaped holes. The second ring is comprised of a plurality of round-shaped holes. At least one of the hexagonal-shaped holes of the first ring is aligned with at least one of the round-shaped holes of the second ring. Preferably, each of the hexagonal-shaped holes of the first ring is aligned with a corresponding round-shaped hole of the second ring. In the embodiment shown in Figs. 2 and 4, the two rings of the slip wheel assembly **28** are connected together by a plurality of nuts and bolts. It will be appreciated that alternative methods of connecting the two rings together may be utilized (such as welding) without departing from the spirit and scope of the instant invention. Furthermore, it will be appreciated that alternative hole shapes, arrangements and patterns may be utilized, as well as other suitable structures for slip wheel assembly **28**, depending upon the particular parts to be received and held, without departing from the spirit and scope of the instant invention.

[0025] In the embodiment shown in Fig. 2 and 4, the retainer wheel assembly **24** is comprised of a plurality of retainer assemblies **124** (a detailed perspective view of the retainer assembly **124** is shown in Fig. 3). Each retainer assembly **124** is mounted to a mounting plate of the retainer wheel assembly **24**. Each retainer assembly **124** is comprised of a rigid member **224** and a generally flexible member **324**. Preferably, the retainer assembly **124** is made of a glass-filled nylon material. Preferably, the rigid member **224** and a generally flexible member **324** are generally Y-shaped. It will be appreciated that numerous alternative materials for retainer assembly **124**, as well as alternative shapes and configurations of retainer assembly **124** may be

utilized without departing from the spirit and scope of the instant invention.

[0026] In operation, parts that need to be cleaned, such as baskets **30** and/or skewers **40**, are placed into assembly **20** by placing the rear end of the part, which typically includes a pin or hex end into receiving holes of slip wheel assembly **28**. As is discussed above, in a preferred embodiment slip wheel assembly **28** includes hex holes through a first ring, and round holes through a second ring, so as to accommodate a wide variety of end geometries (including but not limited to round pins, hex pins and hex pins with round end tips). The opposing end of each basket **30** or skewer **40** (which typically include a round/cylindrical pin and a retention groove) is placed into one of numerous retainer assemblies **124** which are mounted to the retainer wheel assembly **24**. Each retainer assembly **124** includes a rigid member **224** and a generally flexible member **324**. The rigid member **224** receives the end of the basket **30**, skewer **40**, or other part as it is being positioned downward into retainer assembly **124** and forces the end into a safe downward position as it is placed within flexible member **324**. This protects flexible member **324** from undue fatigue and damage. As previously described, in a preferred embodiment, retainer assembly **124** is made of a glass-filled nylon or other suitable material; nevertheless it will be appreciated that alternative materials may be utilized without departing from the spirit and scope of the instant invention.

[0027] In a preferred embodiment, assembly **20** will be constructed and positioned in wash tank **10** such that when wash tank **10** is filled with soap and water for operation, the top of assembly **20** will be above the water line. This allows operators to load and unload parts such as baskets **30**, skewers **40**, and/or other parts above, or partially above, the water line, thereby permitting the operators to easily see what they are doing and safely load and unload parts from the machine. Shaft **22** freely rotates with the grooves of bearings **26** and **26'** to allow operators

to easily rotate assembly **20** for loading and unloading. Furthermore, the water line will be above the top of jets **12**. This allows assembly **20** to passively rotate when the washing machine is in operation as the jet-stream created by jets **12** against baskets **30**, skewers **40**, and/or other parts will create a rotational force. The rotation of assembly **20** results in exposure of all surfaces of baskets **30**, skewers **40**, and/or other parts to the cleaning action of the washing machine. With a lid in a closed position, the instant invention reduces the upward splashing of cleaning fluid and reduces the risk of injury to bystanders and nearby objects caused by moving parts of the system. Equipped with a rack that is removable or capable of being in a closed or open position, the system may additionally be used for scrap, pre-rinse, and final rinse, thereby reducing the overall footprint of the machine by eliminating the need for separate scrap and rinse basins. Although in the embodiment discussed above the rotation of assembly **20** is caused passively by the jet-stream created against baskets **30**, skewers **40**, and/or other parts positioned within assembly **20**, it will be appreciated that assembly **20** may also include suitable structure for receiving the force exerted by the jet-stream. In one embodiment assembly **20** includes cross-members connecting the outer perimeter of retainer wheel assembly **24** to the outer perimeter of the slip wheel assembly **28**, such that the jet-stream exerts of force on the cross members. In another embodiment, the cross member is a basket for holding parts to be cleaned.

[0028] In the foregoing description, certain terms have been used for brevity, clearness and understanding; but no unnecessary limitations are to be implied therefrom beyond the requirements of the prior art, because such terms are used for descriptive purposes and are intended to be broadly construed. Moreover, the description and illustration of the inventions is by way of example, and the scope of the inventions is not limited to the exact details shown or described.

[0029] Although the foregoing detailed description of the present invention has been described by reference to an exemplary embodiment, and the best mode contemplated for carrying out the present invention has been shown and described, it will be understood that certain changes, modification or variations may be made in embodying the above invention, and in the construction thereof, other than those specifically set forth herein, may be achieved by those skilled in the art without departing from the spirit and scope of the invention, and that such changes, modification or variations are to be considered as being within the overall scope of the present invention. Therefore, it is contemplated to cover the present invention and any and all changes, modifications, variations, or equivalents that fall with in the true spirit and scope of the underlying principles disclosed and claimed herein. Consequently, the scope of the present invention is intended to be limited only by the attached claims, all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

[0030] Having now described the features, discoveries and principles of the invention, the manner in which the invention is constructed and used, the characteristics of the construction, and advantageous, new and useful results obtained; the new and useful structures, devices, elements, arrangements, parts and combinations, are set forth in the appended claims.

[0031] It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

CLAIMS

What is claimed is:

1. A system for cleaning parts in a wash tank at least partially filled with a cleaning fluid comprising:
 - a wash tank including a bottom wall, a rear wall, a front wall and two side walls extending generally upwardly from said bottom wall;
 - at least one jet nozzle to expel a stream of fluid into said wash tank; and
 - an assembly rotatably mounted within said wash tank, said assembly being capable of holding parts for cleaning;wherein during operation at least a portion of said assembly or said parts held by said assembly is located within the stream of fluid expelled by said jet nozzle.
2. The system of claim 1, wherein said jet nozzle is located along said rear wall.
3. The system of claim 1, wherein said assembly passively rotates due to the stream of fluid expelled by said jet nozzle.
4. The system of claim 1, wherein said assembly is attached to the inside of said wash tank such that, when said wash tank is filled with a cleaning solution, a portion of said assembly is not submerged.
5. The system of claim 1, further comprising a lid covering at least a portion of said wash tank.
6. The system of claim 5, wherein the lid has a closed position and the system further

comprises a safety switch, wherein the safety switch stops the operation of the system when the lid is not in the closed position.

7. The system of claim 1, further comprising a scrapping/rinsing rack.
8. The system of claim 7, wherein the rack is located along the front wall of the wash tank.
9. The system of claim 7, wherein the rack includes a plurality of holes or an open framework to allow fluid to flow from the tank into the rack and drain out of the rack into the tank.
10. The system of claim 7, wherein the rack further comprises a plurality of support structures sized and shaped to receive skewers, baskets and other parts.
11. The system of claim 7, wherein the rack is removable from the system.
12. The system of claim 1, wherein said assembly comprises:
a retainer wheel assembly; and
a slip wheel assembly opposing said retainer wheel assembly.
13. The system of claim 12 wherein said slip wheel assembly comprises at least one ring with a plurality of holes.
14. The system of claim 12 further comprising a first bearing connecting said retainer wheel assembly to a wall of said wash tank, and a second bearing connecting said slip wheel assembly to a wall of said wash tank.
15. The system of claim 14 wherein at least one of the first and second bearings further

comprises a groove for receiving a shaft of one of said retainer wheel assembly or said slip wheel assembly.

16. The system of claim 12, wherein said slip wheel assembly comprises a first ring with a plurality of hexagonal-shaped or other specially shaped holes and a second ring with a plurality of round-shaped or other specially shaped holes.

17. The system of claim 12, wherein the retainer wheel assembly comprises a plurality of retainer assemblies.

18. The system of claim 17, wherein each retainer assembly comprises a rigid member and a generally flexible member.

19. The system of claim 1 wherein said wash tank is filled with a cleaning solution to a level at least above said jet nozzle.

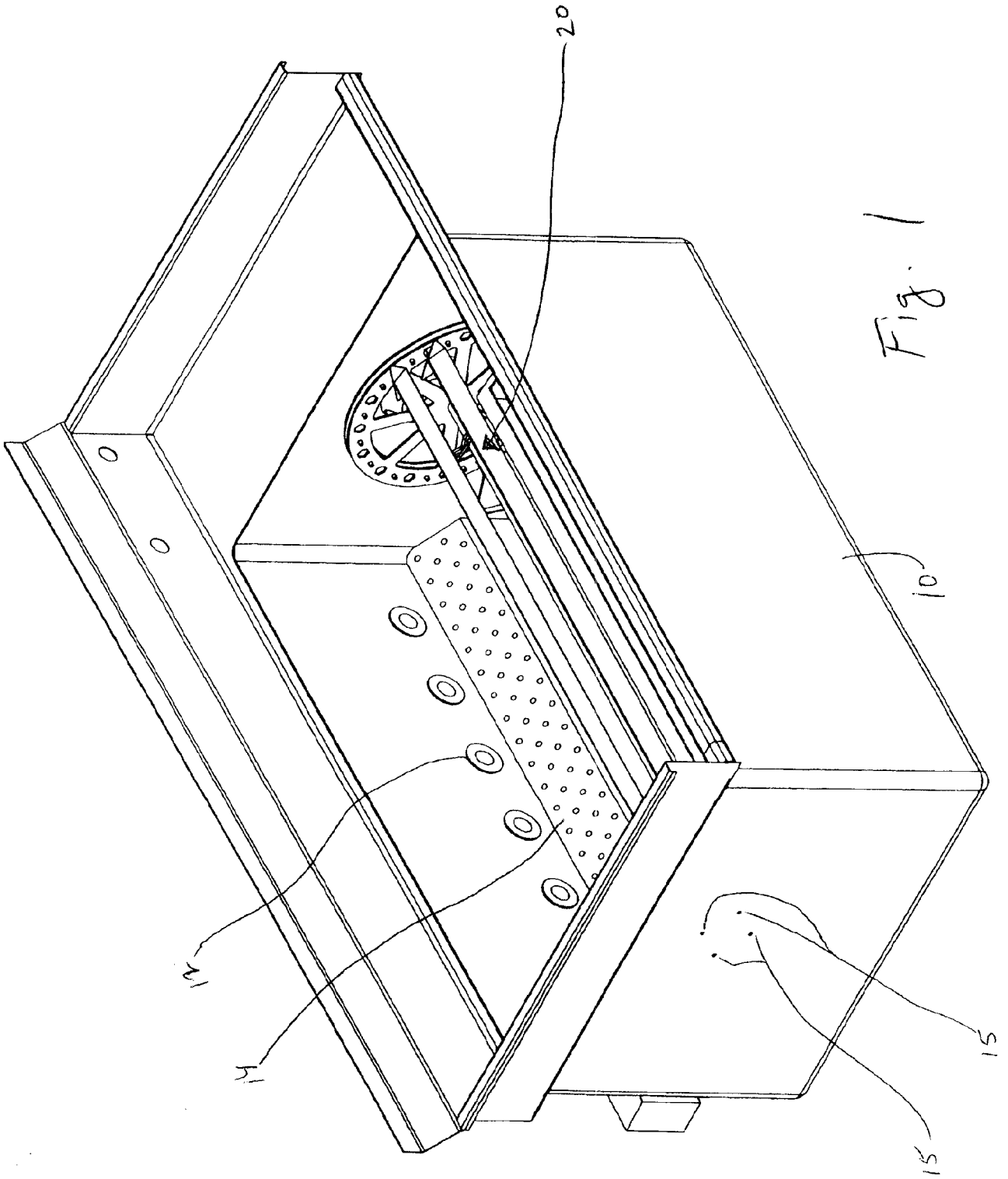
20. A method of cleaning parts in a wash tank at least partially filled with a cleaning fluid comprising the steps of:

- inserting a part into a assembly;
- locating said assembly in a wash tank;
- directing a stream of cleaning fluid at the assembly; and
- rotating the assembly.

21. The method of claim 20, wherein said rotating step is accomplished passively by the force exerted upon the assembly or a part held by said assembly by the stream of fluid from said directing step.

22. The method of claim 20, further comprising the step of filling said wash tank with a cleaning fluid to a level at least above a level of a source of said stream.

23. The method of claim 20, further comprising the step of filling said wash tank with a cleaning fluid to a level such that a portion of said assembly is not submerged during said rotating step.



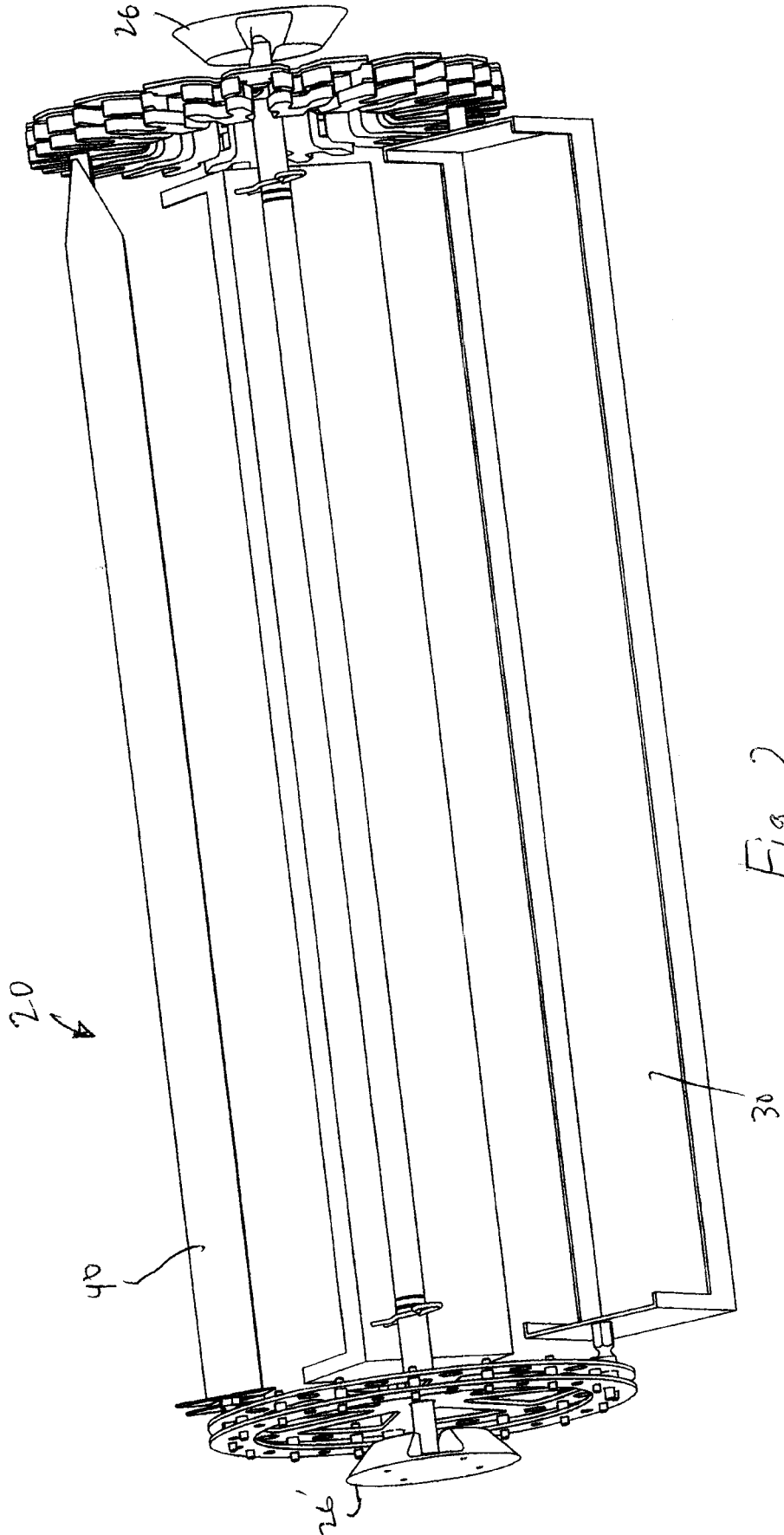


Fig. 2

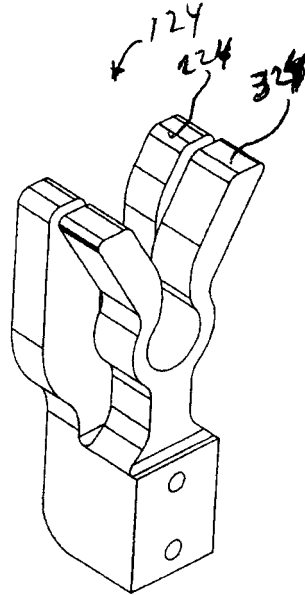


Fig. 3

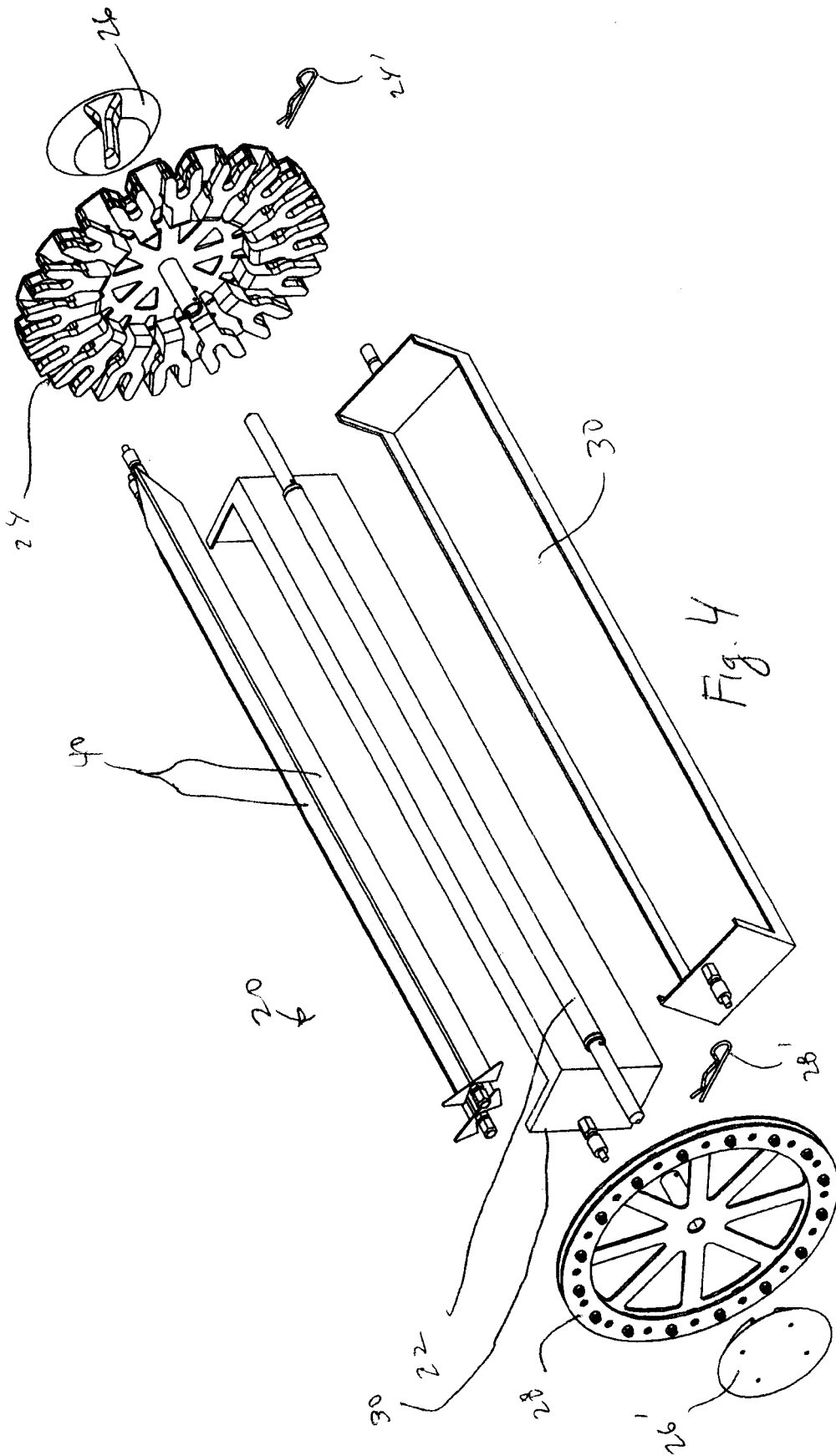


Fig. 4

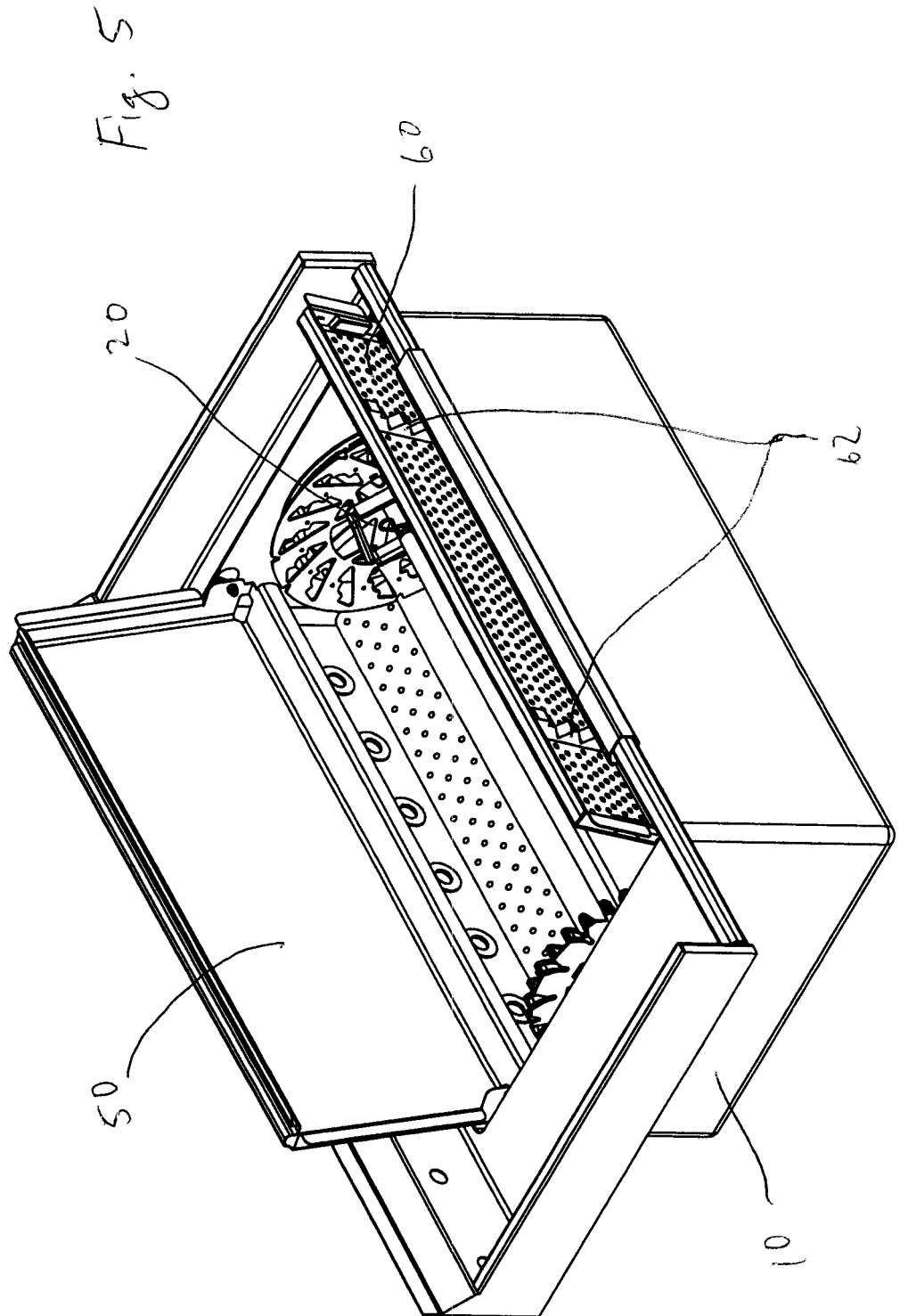


Fig 6

