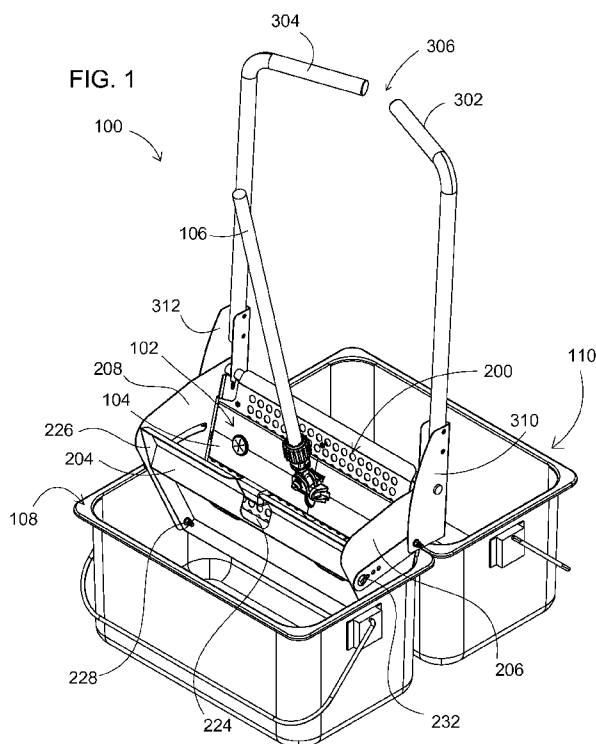




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- (54) Title: WRINGER FOR MOPS, INCLUDING FLAT MOPS AND STRING MOPS



(57) Abstract: A wringer, for example for mops, includes one or more positioning elements to position a mop at least in one dimension in the wringer, for example to a desired depth in the wringer, to wring the mop. The positioning elements are other than a bottom surface of the wringer. A wringer is also disclosed in which a wringing surface is moved toward another wringing or a base surface in a drawing or pulling motion. A wringer is also disclosed where the wringing operation can be activated by a pivoting or other mechanism that can be operated from at least two positions, a plurality of spaced apart locations, from handles, or by way of structures positioned outside of a wringing envelope defined by wringing plates or other components contacting a mop element. The structures can be used to operate the wringer even if a handle of a mop element extends outward of the wringing envelope.

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WRINGER FOR MOPS, INCLUDING FLAT AND STRING MOPS

BACKGROUND

5 Field

A wringer can be used for flat mops and string mops, and other mops and other articles.

SUMMARY

10 A wringer for mops can be used with flat mops, string mops, other mops and loose or miscellaneous materials such as wipes, and the like. In one configuration, the wringer can accept and reliably wring a flat mop. Flat mops typically have a relatively consistent thickness laterally and forward and backward from a mop handle attachment area, and may be more difficult to
15 wring uniformly across the mop head. In one example of a wringer, positioning elements, posts, bosses or other locating devices can be used to position a flat mop at least in one dimension in the wringer, for example to a desired depth in the wringer, to wring the mop. The positioning elements are other than at the bottom of the wringer. For lateral positioning, the positioning
20 elements are other than the lateral extremes of the interior of the wringer. This may be desirable, for example, in press wringers, including, for example, wringers in which one or several plates or wringing surfaces move toward another surface in an arcuate motion to press the mop head.

In another example of a wringer, for example a press wringer, a
25 wringer can accommodate flat mops, as well as string mops and other nonuniform mop geometries and accomplish the desired wringing with flat wringing surfaces, and sufficient spacing between wringer surfaces to receive and wring non-uniform geometries such as string mops, miscellaneous materials, and the like. The spacing between wringer surfaces and a depth of
30 a cavity between wringing surfaces may be selected so as to accommodate both flat mops and string mops.

In another example of a wringer, a press wringer can be configured to move a wringing surface toward another wringing or base surface in a drawing or pulling motion. A drawing or pulling motion for a wringing surface

allows for stability and reliable pressing action in a wringer assembly.

Additionally, wringing action can be activated or actuated by an external mechanism outside an envelope or active wringing area of a wringer. In a further example, a wringing mechanism can be actuated or activated by a pivoting, or other mechanism that can be operated from at least two positions. In one example, the wringing action can be activated or actuated at a plurality of spaced apart locations, for example at opposite ends of an axis, or shaft. In another example, a wringing action can be actuated or activated by one or more of a plurality of handles. In a further example, a wringing mechanism is activated or actuated by handles positioned at opposite end portions of an actuating mechanism for a wringer.

In another example of utility equipment, for example a wringer for mops, the equipment can have a plurality of handles having grasping portions accessible to a user, for example handles spaced upward and away from a wringer. Handle portions can be spaced apart from each other, and independently grasped by the user. Handle portions can be separated but linked in such a way that manipulation of one, of the other or of both handle portions will actuate the device, such as a wringer.

In another example of a utility device, for example a wringer, the utility device may include one or more handles for operating the device, wherein one or more of the handles have a plurality of configurations. In one configuration, for example, the handle or handles can be used to operate the utility device, and in another configuration, the handle or handles can be used to move the device from one location to another. In a further configuration, a handle can have a locked configuration for transport and/or storage.

In another configuration, handles on a mop wringer can be configured to actuate a wringer action by moving in a direction across a normal or operating zone or area of accessibility for a mop, without affecting the operation of the wringer or accessibility for the mop into the wringer area. For example, handles can be positioned on different sides of an operating zone or effective area for the wringer, and be split in such a way that operation of the handles still allows access to the operating zone or area for wringing.

These and similar configurations can also be used for wringing a mop and providing access to the contents of a bucket to which the wringer is

mounted or supported without having to move or adjust the position of the wringer.

These and other examples are set forth more fully below in conjunction with drawings, a brief description of which follows.

5

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an upper isometric view of a wringer assembly supported by a double bucket system in accordance with one example of the present configurations.

10 FIG. 2 is an upper right isometric view of the wringer assembly of FIG. 1.

FIG. 3 is a lower left isometric view of the wringer assembly of FIG. 1.

FIG. 4 is a front elevation view of the wringer assembly of FIG. 1.

FIG. 5 is a bottom plan view of the wringer assembly of FIG. 1.

15 FIG. 6 is a right side elevation view of the wringer assembly of FIG. 1.

FIG. 7 is a left side elevation view of the wringer assembly of FIG. 1.

FIG. 8 is a top plan view of the wringer assembly of FIG. 1.

FIG. 9 is a detail and right side elevation view of a portion of the wringer assembly of FIG. 1.

20 FIG. 10 is a right sagittal section of the wringer assembly of FIG. 1.

FIG. 11 is a detail of a portion of the wringer assembly of FIG. 1 and a mop taken at "11" of FIG. 10.

FIG. 12 is an upper right isometric view of a base plate of the wringer of FIG. 1.

25 FIG. 13 is a front elevation view of the base plate of FIG. 12.

FIG. 14 is a right side elevation view of the faceplate of FIG. 12.

FIG. 15 is a front left isometric view of a press plate of the wringer of FIG. 1.

FIG. 16 is a front elevation view of the press plate of FIG. 15.

30 FIG. 17 is a left side elevation view of the press plate of FIG. 15.

DETAILED DESCRIPTION

This specification taken in conjunction with the drawings sets forth examples of apparatus and methods incorporating one or more aspects of the present inventions in such a manner that any person skilled in the art can
5 make and use the inventions. The examples provide the best modes contemplated for carrying out the inventions, although it should be understood that various modifications can be accomplished within the parameters of the present inventions.

Examples of wringers and of methods of making and using the
10 wringers are described. Depending on what feature or features are incorporated in a given structure or a given method, benefits can be achieved in the structure or the method. For example, wringers drawing pressure plates together may provide for a more stable construction. Wringers having adjustable handle configurations provide more flexibility and/or stability in use.
15 Additionally, wringers having a plurality of handles may also provide flexibility in use. Wringers having a spaced apart or separated handle configurations may also more easily accommodate devices such as mops having extended handles, while still permitting easy access to the wringer and/or a bucket system on which the wringer is supported.

20 These and other benefits will become more apparent with consideration of the description of the examples herein. However, it should be understood that not all of the benefits or features discussed with respect to a particular example must be incorporated into a wringer, component or method in order to achieve one or more benefits contemplated by these
25 examples. Additionally, it should be understood that features of the examples can be incorporated into a wringer, component or method to achieve some measure of a given benefit even though the benefit may not be optimal compared to other possible configurations. For example, one or more benefits may not be optimized for a given configuration in order to achieve
30 cost reductions, efficiencies or for other reasons known to the person settling on a particular product configuration or method.

Examples of a number of wringer configurations and of methods of making and using the wringers are described herein, and some have particular benefits in being used together. However, even though these

apparatus and methods are considered together at this point, there is no requirement that they be combined, used together, or that one component or method be used with any other component or method, or combination.

Additionally, it will be understood that a given component or method could be combined with other structures or methods not expressly discussed herein while still achieving desirable results.

Flat mop wringers are used as examples of a wringer that can incorporate one or more of the features and derive some of the benefits described herein. However, other mops such as string mops and other cleaning materials can also be used with the wringers described herein.

It should be understood that terminology used for orientation, such as front, rear, side, left and right, upper and lower, and the like, are used herein merely for ease of understanding and reference, and are not used as exclusive terms for the structures being described and illustrated.

In one example, a wringer assembly 100 can be used to wring a flat mop, a string mop, loose cleaning materials or other products. In the present example described herein, the wringer 100 will be described with respect to a flat mop 102 having a mop base 104 supported by and controlled with an extended handle 106. Other mop configurations and materials can be easily accommodated in the wringer described herein, and one or more alternative configurations of the wringer can easily accommodate a flat mop such as that shown in FIGS. 1-11.

The wringer assembly 100 can be supported by one or more conventional buckets 108 and 110. In the present example illustrated in FIG. 1, the wringer is supported by a double bucket arrangement, with or without a cart, with the wringer supported over and extending into a portion of the interior of the bucket 108. In this configuration, the flat mop 102 as well as other mops can be wrung with the wringer assembly 100 and saturated or wetted with fluid contained in the bucket 108.

In the configuration of the wringer assembly 100 shown in FIGS. 1-11, the wringer assembly is actuated by pulling handles (described more fully below) in the direction of the opposite side of the bucket 108 and away from the bucket 110. In this configuration, the double bucket system and any cart or platform on which the assembly is supported better supports the wringer

assembly during the wringing operation, reducing the possibility of the assembly tipping. Additionally, the wringer assembly can be positioned to one side of the bucket while leaving the opposite side open for access for the user, for example to insert into and withdraw a mop from the interior of the bucket.

The configuration of the wringer assembly and the mop in the position shown in FIG. 1 also allows the handles to be positioned or mounted on a portion of the wringer behind or outside the wringing or working area of the wringer accessible to the mop, and still allow the handles to actuate the wringer in a way that the actuation assembly with the handles does not interfere with the positioning of the mop or the mop handle. In one configuration, split or separated handles on the wringer allows the mop handle 106 to remain in a desired position during the wringing operation.

Additionally, a multiple handle wringer configuration can allow either one or both handles to actuate the wringing mechanism, and split or separated handles allow the flexible wringing operation without interfering with the mop.

In one example of the wringer assembly 100 shown in FIGS. 1-11, the wringer assembly may include various arrangements for mounting the wringer assembly to a support structure, for example the buckets 108 or 110. In the present example, the wringer assembly includes a mounting bracket 112.

The mounting bracket 112 is mounted to a rear outer surface of a pressure plate, in the present example a base pressure plate 202, described more fully below. The mounting bracket includes an angled or arcuate support structure 114. The support structure helps to position the wringer on the support surface such as the upper rim of a bucket, and laterally position the wringer relative to the bucket rim. The arcuate support structure 114 extends almost the entire width of the wringer.

The mounting bracket 112 is integral with or monolithic with a backplate 116. The backplate 116 is mounted to the base pressure plate 202 over a substantial vertical and horizontal distance of the base pressure plate 202. In the present example, the backplate 116 is mounted to the base pressure plate through a plurality of standoffs 118. The standoffs provide spacing between the backplate 116 and the perforated base pressure plate 202. The backplate 116 is a solid structure, without any perforations, and

serves as a backslash and channel wall to channel excess fluid down the backplate 116 and into the underlying bucket.

The wringer assembly 100 includes a wringing assembly 200 and an actuation or activation assembly 300. The wringing assembly 200 forms a cavity, depression or groove between the base pressure plate 202 and a pressing plate 204. In the present example, the base pressure plate 202 is stationary and the pressing plate 204 is movable. However, in other configurations, both can be movable. The wringing assembly also includes side supports 206 and 208. The side supports define the lateral boundaries of the wringing enclosure. The side supports are supported on the base plate 202, and may be mounted to, formed integral with or otherwise fixed to the base pressure plate 202.

In the present example, the base pressure plate 202, pressing plate 204 and the side supports 206 and 208 help to form a "structural wringing envelope". The "structural wringing envelope" in the present configuration shown in FIGS. 1-11 is a geometric volume defined by the uppermost edges of the pressure plate 202, the pressing plate 204 and of the side supports 206 and 208, and the bottoms of those structures, within which volume wringing can occur. Not all points within the structural wringing volume may be effective in wringing function, and for example a cut out in a wall of the structural wringing envelope for receiving a component of a mop may result in a portion of the structural wringing envelope being ineffective for functional wringing. In contrast to the structural wringing envelope, a "functional wringing envelope" is the functional interior surface areas that can produce a wringing function when a mop element is placed at a point within the volume of the structural wringing envelope. Therefore, there may be instances in which the volume of a structural wringing envelope is greater than the effective or functional wringing envelope volume.

The base pressure plate 202 is a substantially planar perforated plate. A mop structure is pressed against the plate, and the perforations 210 (FIGS. 12-13) help to wring the mop when the mop and the plate are pressed against each other. A plurality of openings 212 allow the base pressure plate 202 to be mounted through the standoffs to the base plate 116. A substantially central opening 214 provides a gap, space or cavity for receiving a portion of

the hardware of the mop structure, for example a nut or other protrusion on the mop assembly, thereby allowing more reliable contact between the mop and the base pressure plate 202 without substantial interference from protruding or obstructing components.

5 The base pressure plate 202 may include a flange plate 216 (FIGS. 11-13). The flange plate 216 helps to guide the mop into the wringing cavity and reduce splashing outside the bucket 108. A support flange 218 helps to support the wringer assembly against an interior wall of the bucket 108.

 The press plate 204 in the present example is a substantially
10 unperforated plate (FIGS. 1, 2-8 and 15-17). In the illustrated example, the press plate 204 includes a laterally extending channel 220 recessed below the working surface 222 of the press plate. The channel 220 receives a mounting bar 224 (FIGS. 1 and 10) that supports the press plate in the wringing assembly. The channel 220 also provides a recess for accommodating any
15 hardware, such as mop hardware, that might reduce the effectiveness of the wringing action. The press plate 204 in the present example also includes side mounting plates 226 at each lateral side of the press plate to help mount and support the press plate in the wringing assembly. The mounting bar 224 passes through openings in the side mounting plates so that movement of the
20 mounting bar will move the press plate 204. The side mounting plates and therefore the press plate are mounted pivotally to the respective side plates 206 and 208 through fasteners 228. The upper portion of the press plate is supported in grooves 230 in the side plates 206 and 208 through the rod 224 extending in the recess 226 through the plates 226 and through the grooves
25 230 and fastened in place and secured for arcuate movement in the grooves 230 by fasteners 232.

 In one configuration of the press plate 204, the press plate can include one or more openings 234. In the present example, the press plate includes two openings having an oval shape. The openings receive a respective
30 number of positioning elements, in the present example press blocks 236 mounted on, secured to or formed in the base pressure plate 202. As shown in FIG. 11, a flat mop placed against the base pressure plate 202, for example resting on the press blocks 236, will be pressed against the pressure plate 202 by the press plate 204 after the press blocks 236 have passed through

the openings 234. In a typical operation, the flat mop is positioned against the base plate and on the press blocks 236 in the orientation shown in FIG. 11.

The handle or other support structure of the mop assembly would fit through the opening 238 in the top surface of the press plate 204, thereby allowing the press plate to make contact with the back surface of the flat mop head.

Typically, positioning elements would be mounted within the structural wringing envelope, but it is possible a positioning element can be located outside the structural wringing envelope and used in such a way as to position, suspend or otherwise locate a mop element at a desired location in the functional wringing envelope.

In an alternative configuration, if the mop assembly were reversed relative to the pressure plate and press plate, the working surface of the flat mop is placed against the interior surface of the press plate 204. As there is no stop surface on the press plate 204 limiting the downward movement of the flat mop along the surface of the press plate 204, the flat mop may extend further downward into the cavity between the pressure plate 202 and the press plate 204 than the position shown in FIG. 11. To wring the flat mop, the press plate is closed toward the pressure plate 202, and the press blocks 236 bear against the backside of the flat mop head, thereby pressing the opposite surfaces of the flat mop and the press plate against each other, thereby wringing the flat mop. Alternatively, if the flat mop is positioned in the cavity between the pressure plate 202 and the press plate 204 higher than the press blocks 236, the press blocks will fit into the openings 234, and the press plate 204 will continue closing against the flat mop to press the flat mop and the press plate against each other. The press plate 204 moves toward and away from the pressure plate 202 through action of the actuation assembly 300. Fluid wrung from the mop assembly flows through the perforations in the pressure plate 202 and also out through the bottom of the wringing cavity through a gap between the pressure plate 202 and the press plate 204.

The relative positions of the pressure plate and the press plate, and the spacing at the bottoms of those two plates also permit string mops and other mop and wiping materials to be wrung in the wringer.

The actuation assembly 300 in the present example includes at least one handle, and in the present example first and second laterally spaced

apart handles 302 and 304. In the present example, a pair of handles is included so that the wringing assembly can be actuated through either handle, from either side of the wringing assembly. Also in the present example, the actuation assembly is positioned relative to the wringing assembly outside the wringing area, and behind the wringing assembly relative to the opening in the bucket. This positioning allows greater stability during the wringing action, and positioning of the handles further from the perimeter areas of the bucket assembly. In a double bucket assembly, the handles can be positioned in a center area of the assembly, and the handles pulled across one of the buckets to actuate the wringing of a mop. In the present example, horizontally extending handle portions extend in different directions, non-parallel to each other. A gap 306 can be included between the handles to provide clearance for the extended mop handle 106. The gap 306 in one configuration is at least the handle diameter or maximum width of the mop used with the wringer, and can be at least one half inch or 1 inch and as high as 4-6 inches or more. The gap 306 is considered to be the spacing when the handle ends are at their closest, and can be selected to be sufficiently small as to allow the handle ends to pass one another, and a mop handle can pass between the ends when the handles are offset from each other, for example due to tolerances and mechanical looseness in the parts. As a result, the handles can be moved to wring the mop even while the extended handle of the mop is extending upward.

The actuation assembly 300 is mounted for pivoting action to the side plates 206 and 208 by a pivoting shaft 308 (FIGS. 10-11). The shaft 308 is pivotably mounted through the side plates 206 and 208 through side plate openings 310 and 312 (FIG. 12). The handles 302 and 304 pivot around the pivoting shaft 308 to carry out the wringing action. The handles are mounted to the pivoting shaft through respective lever plates or lever linkages 310 and 312. In the present configuration, the lever plates are U-shaped channels having side plates extending in two directions, upwardly (in the views shown in the Figures) to receive and secure the handles, and laterally to receive and secure press linkages to the press plate 204. The upward and lateral directions provide a moment arm for moving the press linkage upon the movement of the handles 302 and/or 304.

The lever linkages 310 and 312 pivotably couple respective press linkages 314 and 316 (FIGS. 2, 6 and 9). The respective press linkages 314 and 316 are pivotably coupled to lever linkages 310 and 312 through respective fasteners 318 and to the rod 224 through respective fasteners 320.

5 Actuation of the handles 302 and 304, for example in the view shown in FIG. 9 counterclockwise and over the wringer and across and past the press plate 204, pivots the linkages 310 about the pivoting shaft 308. The linkages through fasteners 318 pivot counterclockwise, to the right in the view shown in FIG. 9, and draw the linkages 314 and 316 to the right (as viewed in FIG. 9).

10 The rod 224 draws the press plate 204 toward the pressure plate 202 as the rod translates through the arcuate grooves 230. Releasing the handles or moving the handles back toward their upright positions shown in FIG. 1 reverses the travel of the apparatus.

The press linkages 314 may include multiple openings 322 for positioning the press plate in a desired resting position by way of positioning the rod 224. In a more closed position or configuration, the wringer assembly can be configured to wring only flat mops. In a more open position or configuration, the wringing assembly can be configured to wring not only flat mops but also other mop configurations.

20 A detent, a lock or latch mechanism can be incorporated into the actuation assembly to lock the handles in a desired position or positions. For example, the handles can be locked in a down or downward position relative to that shown in FIG. 1, for example for pushing the assembly from one location to another. Other configurations may be incorporated in the apparatus.

25 Having thus described several exemplary implementations, it will be apparent that various alterations and modifications can be made without departing from the concepts discussed herein. Such alterations and modifications, though not expressly described above, are nonetheless intended and implied to be within the spirit and scope of the inventions.

30 Accordingly, the foregoing description is intended to be illustrative only.

What is claimed is:

1. A wringer comprising a wringing mechanism having at least first and second wringing elements having respective wringing surfaces and an actuating mechanism positioned closer to the second wringing element than to the first wringing element, and wherein the first wringing element is movable toward and away from the second wringing element.
2. The wringer of claim 1 wherein the actuating mechanism includes a pivoting element that can be caused to pivot by a plurality of pivot elements positioned at two different locations on the wringer.
3. The wringer of any of the preceding claims 1-2 wherein the pivoting element includes a shaft on a side of the second wringing element opposite the first wringing element.
4. The wringer of any of the preceding claims 2-3 wherein the plurality of pivot elements are positioned at respective ends of the pivoting element.
5. The wringer of any of the preceding claims 2-4 wherein at least one of the pivot elements is coupled to the first wringing element.
6. The wringer of any of the preceding claims 2-5 further including handles coupled to respective pivot elements and wherein the actuating mechanism can be actuated independently by any one of the handles.
7. The wringer of any of the preceding claims 6 wherein the handles are spaced apart from each other.
8. The wringer of any of the preceding claims 6-7 wherein the handles extend upward when the actuating mechanism is not actuated, and the handles extend across the first wringing element when the actuating mechanism is actuated.

9. The wringer of any of the preceding claims 6-8 wherein the handles include respective handle ends facing in at least partly opposite directions and spaced apart from each other.
- 5 10. The wringer of claim 9 wherein the handle ends are spaced apart from each other at least a half inch.
11. The wringer of any of the preceding claims 1-10 wherein the wringer is a press wringer.
- 10 12. The wringer of any of the preceding claims 1-11 wherein at least one of the first and second wringing elements is perforated.
13. The wringer of any of the preceding claims 1-12 wherein the wringing
15 mechanism includes first and second side plates having respective slots, and wherein portions of the first wringing element extend into respective slots on the side plates.
14. The wringer of claim 13 wherein the first and second side plates are
20 fixed relative to the second wringing element.
15. The wringer of any of the preceding claims 1-14 wherein the actuating mechanism includes at least one linkage between the actuating mechanism and the first wringing element.
- 25 16. The wringer of any of the preceding claims 1-15 wherein the first wringing element is pivotable about a first pivot axis.
17. The wringer of any of the preceding claims 1-16 further including at
30 least one positioning element supported on the second wringing element and positioned between the first and second wringing elements.

18. The wringer of any of the preceding claims 1-17 further including at least one support element on the wringer adjacent the second wringing element.

5 19. The wringer of claim 18 wherein a vertical plane intersects both the at least one support element and the pivoting element.

20. The wringer of any of the preceding claims 1-19 wherein the first wringing element includes a plurality of openings through an interior portion of
10 the first wringing element, and a cut out in an upper portion of the first wringing element.

21. A mop wringer comprising a wringing surface and a housing adjacent the wringing surface, wherein the wringing surface and the housing define a
15 wringing envelope, wherein the wringing envelope includes a lower-most surface that a mop element within the wringing envelope can contact, and wherein at least one of the wringing surface and a surface on the housing within the wringing envelope includes at least one positioning element having a surface opposite the lower-most surface, and wherein the at least one
20 positioning element is sized sufficiently to be contacted by a mop element such that the positioning element limits the movement of the mop element toward the lower-most surface.

22. The mop wringer of claim 21 wherein the wringing surface is a
25 perforated plate.

23. The mop wringer of any of the preceding claims 21-22 wherein the positioning element is mounted to the wringing surface.

30 24. The mop wringer of any of the preceding claims 21-23 wherein the at least one positioning element is a plurality of positioning elements.

25. The mop wringer of any of the preceding claims 21-24 further including a support element mounted adjacent the wringing surface for supporting the mop wringer on a support structure.
- 5 26. The mop wringer of any of the preceding claims 21-25 wherein the housing includes a movable pressing surface configured to move toward the wringing surface.
27. The mop wringer of claim 26 wherein the movable pressing surface
10 includes a recessed surface for receiving a structure on a mop.
28. The mop wringer of any of claims 26-27 wherein the movable pressing surface includes a gap through which a portion of a mop can extend.
- 15 29. The mop wringer of any of the preceding claims 21-28 further including a wringing actuation structure having spaced apart handles.
30. The mop wringer of claim 29 wherein the wringing actuation structure is configured such that movement of a single handle of the spaced apart
20 handles can actuate the wringer.
31. A wringer having a wringer mechanism having first and second wringing components having respective wringing surfaces, wherein the first wringing component is movable in a direction toward the second wringing
25 component, and a handle for actuating the wringer mechanism wherein the handle moves in a second direction toward the first wringing element and away from the second wringing element when the first wringing component is moved in the first direction.
- 30 32. The wringer of claim 31 pivots about a pivot axis closer to the second wringing component than to the first wringing component.
33. The wringer of claim 32 wherein the pivot axis is on a side of the second wringing component opposite the first wringing component.

34. A wringer having a wringer mechanism having first and second wringing components wherein the first wringing component is movable toward the second wringing component, and wherein the wringer mechanism
5 includes at least two handles wherein either of the two handles is configured to actuate the wringer mechanism to move the first wringing component.

35. The wringer of claim 34 wherein the handles are spaced apart from each other.
10

36. The wringer of any of the preceding claims 34-35 wherein the handles are coupled on opposite ends of a pivot shaft.

37. A wringer comprising first and second pressure elements for applying
15 pressure to a material to be wrung, wherein at least one of the first and second pressure elements includes a surface extending laterally of the pressure element and wherein the at least one pressure element includes an opening in the surface between the lateral edges of the at least one pressure element for receiving a structure on a mop or on the other pressure element.

20 38. The wringer of claim 37 wherein the opening defines a cavity having a depth sufficient to receive the structure on a mop or on the other pressure element.

25 39. The wringer of any of the preceding claims 37-38 wherein the at least one pressure element is a movable pressure element.

40. The wringer of claim 37 wherein the opening is a hole.

30 41. The wringer of any of the preceding claims 37 and 40 wherein the opening is cut into an edge of the at least one pressure element.

42. A method of operating a wringer assembly wherein the wringer assembly includes a wringer actuating mechanism having at least one handle,

wherein the wringer assembly further includes first and second wringing surfaces and wherein a portion of the wringer actuating mechanism is mounted adjacent the second wringing surface, wherein the method includes actuating the wringer actuating mechanism by moving the at least one handle
5 through a space used to place a mop between the first and second wringing surfaces.

43. The method of claim 42 further including moving the at least one handle further away from the second wringing surface and closer to the first
10 wringing surface.

44. The method of any of the preceding claims 42-43 wherein moving the at least one handle includes moving the at least one handle from one side of a mop handle to another side of the mop handle.
15

45. The method of claim 44 further including a second handle for actuating the wringer actuating mechanism and moving the at least one handle and the second handle on opposite sides of a mop handle.

20 46. A method of moving a wringer assembly wherein the wringer assembly includes a wringer actuating mechanism and a handle for operating the actuating mechanism, wherein the handle has a first position where the actuating mechanism is unactuated, and a second position where the actuating mechanism is at least partly actuated, the method including moving
25 the handle between the first position and a second position, and moving the wringer when holding the handle while the handle is in the second position.

47. The method of claim 46 further including securing the handle in the second position.
30

48. The method of any of the preceding claims 46-47 further including locking the handle in the second position.

49. The method of any of the preceding claims 46-48 wherein the wringer actuating mechanism includes first and second handles spaced apart from each other and wherein moving the handle between the first position and the second position includes moving the first and second handles on opposite
5 sides of a mop handle.

50. A method of operating a wringer assembly wherein the wringer assembly includes a wringer actuating mechanism and at least one wringing element, the method including placing a mop element against the at least one
10 wringing element and against a positioning element on the wringing element to position a mop element above a bottom of the wringer assembly.

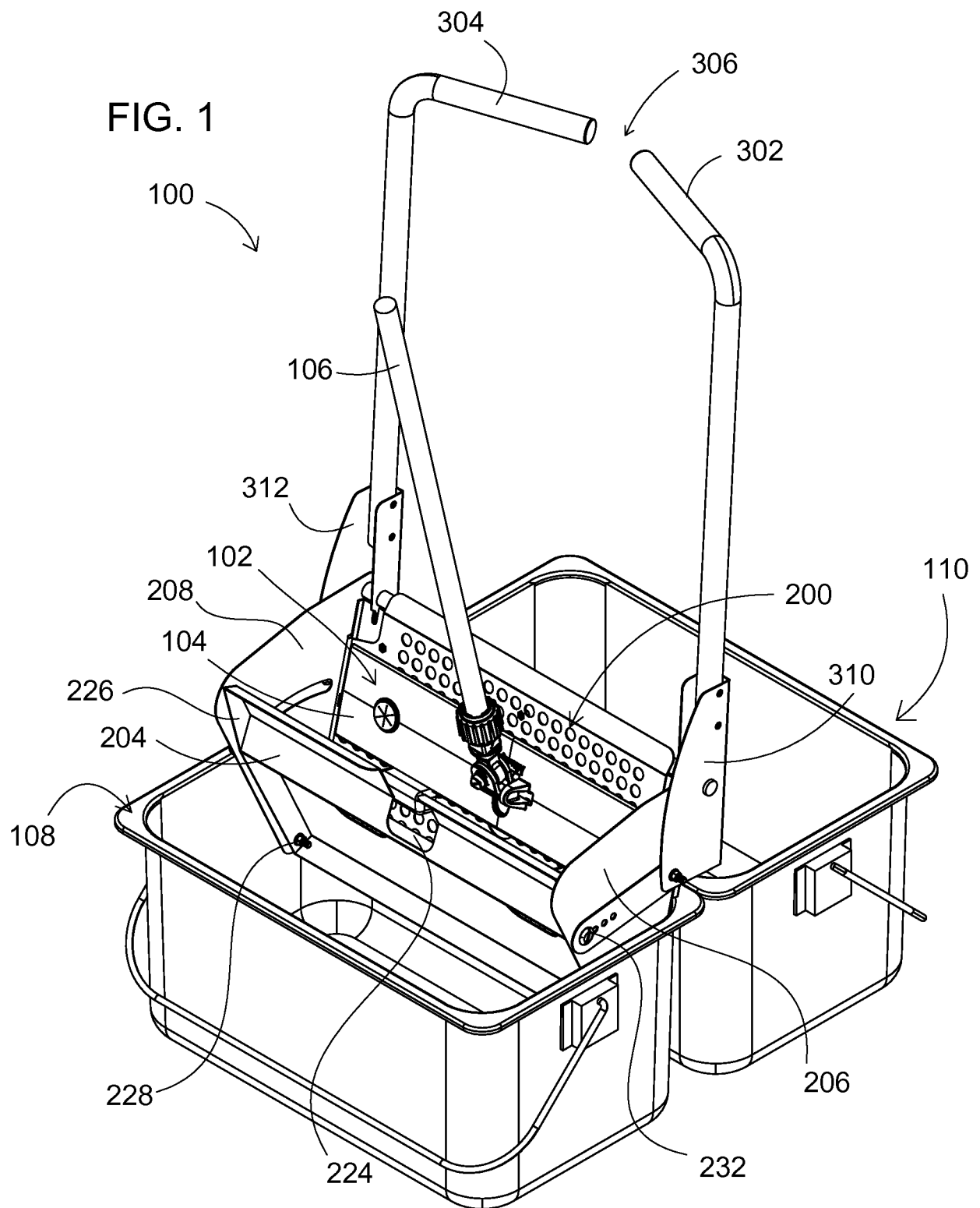
51. The method of claim 50 wherein the mop element is a flat mop element and further including placing the flat mop element against a plurality of
15 positioning elements on the wringing element.

52. The method of any of the preceding claims 50 and 51 further including pressing the mop element against the at least one wringing element when the mop element is on the positioning element.
20

53. The method of any of the preceding claims 50-52 further including moving a second wringing element against a mop element and around the positioning element.

25 54. The method of claim 53 further including positioning the positioning element into a hole in the second wringing element.

55. The method of any of claims 53-54 positioning a portion of the mop element through an opening in the second wringing element.
30



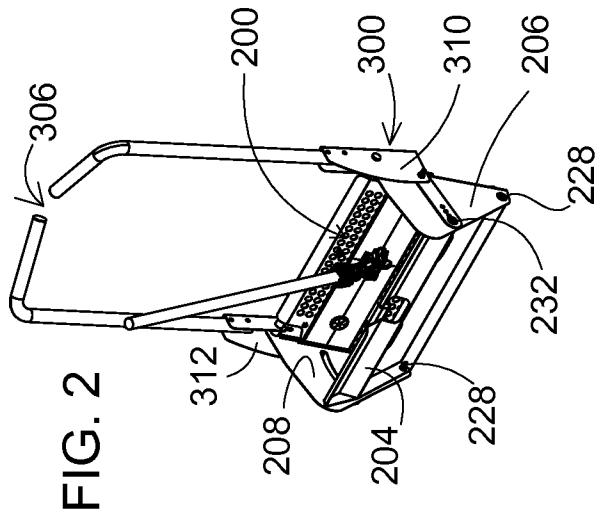


FIG. 2

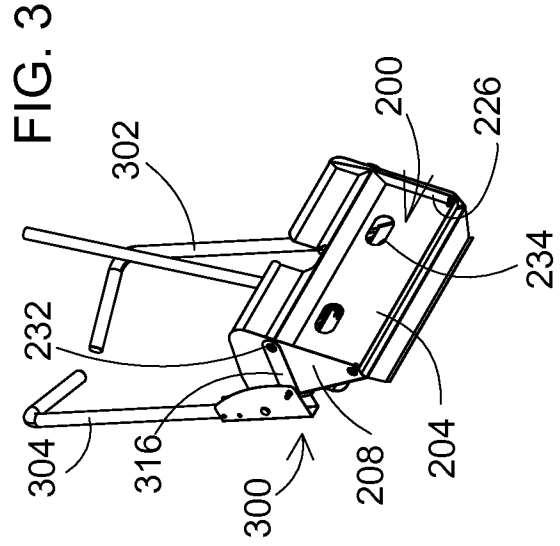


FIG. 3

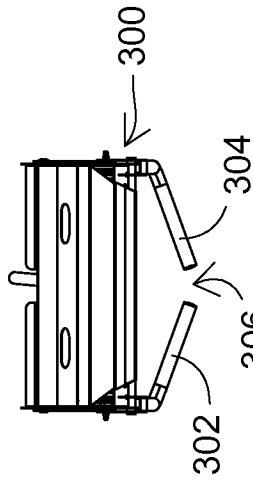


FIG. 5

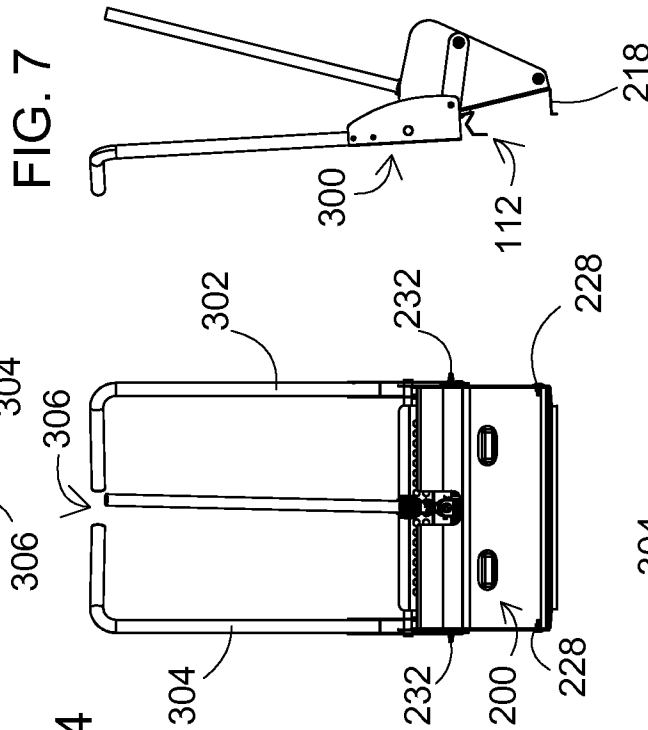


FIG. 4

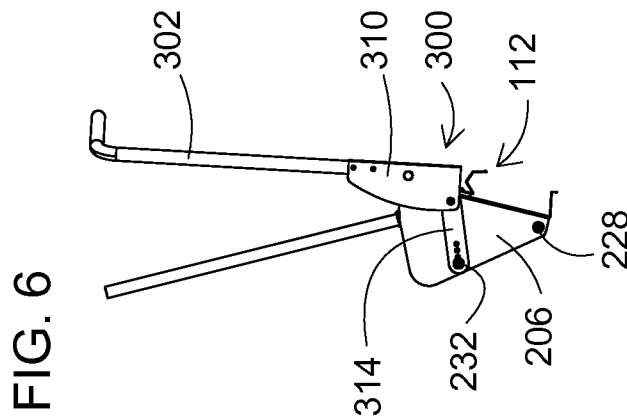


FIG. 6

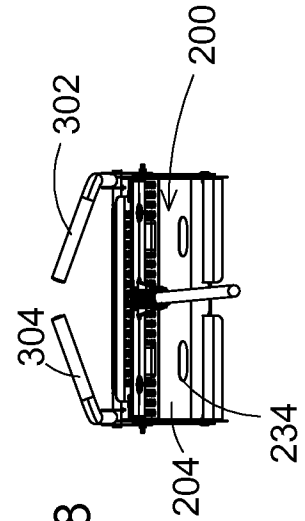


FIG. 8

FIG. 9

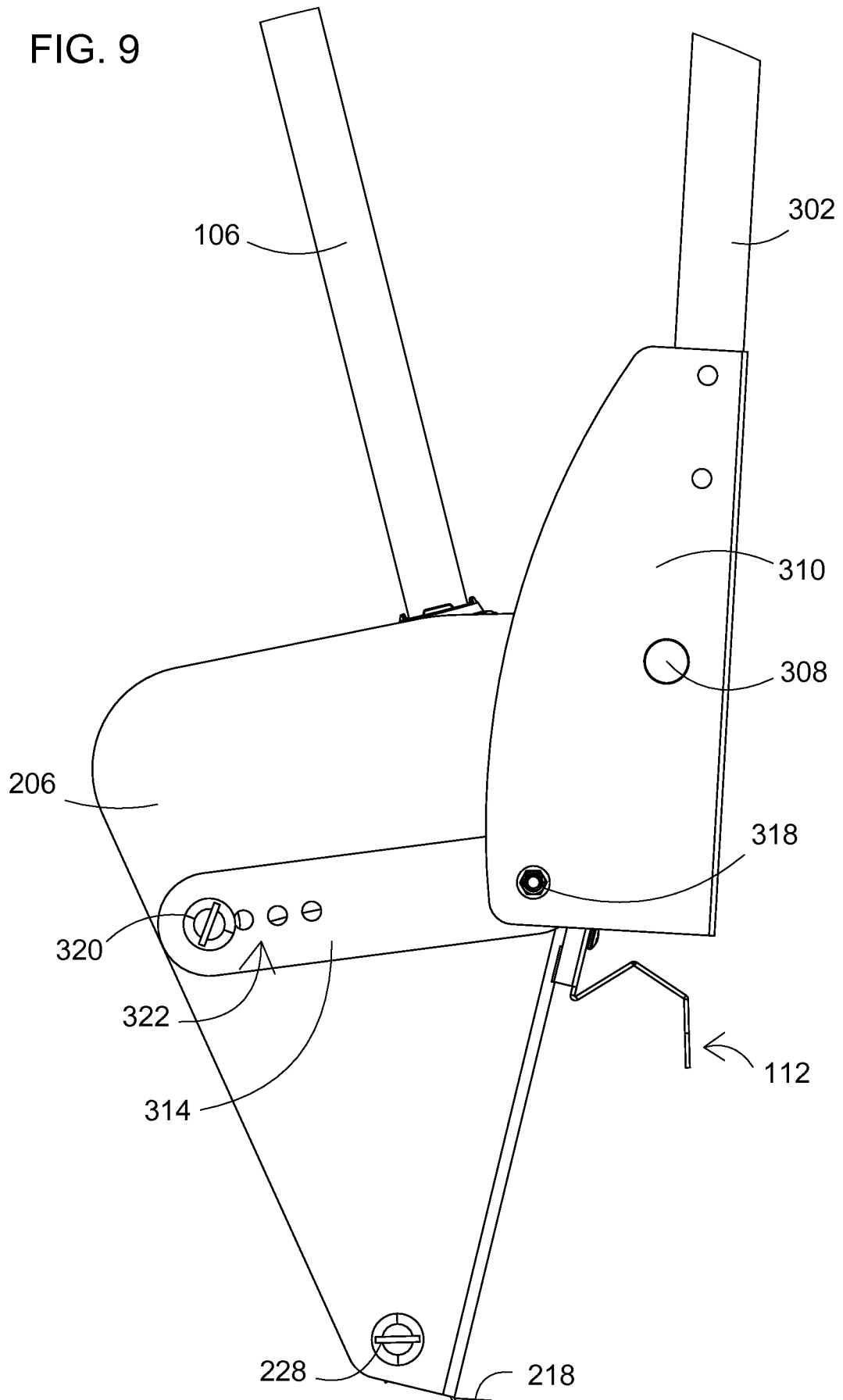


FIG. 10

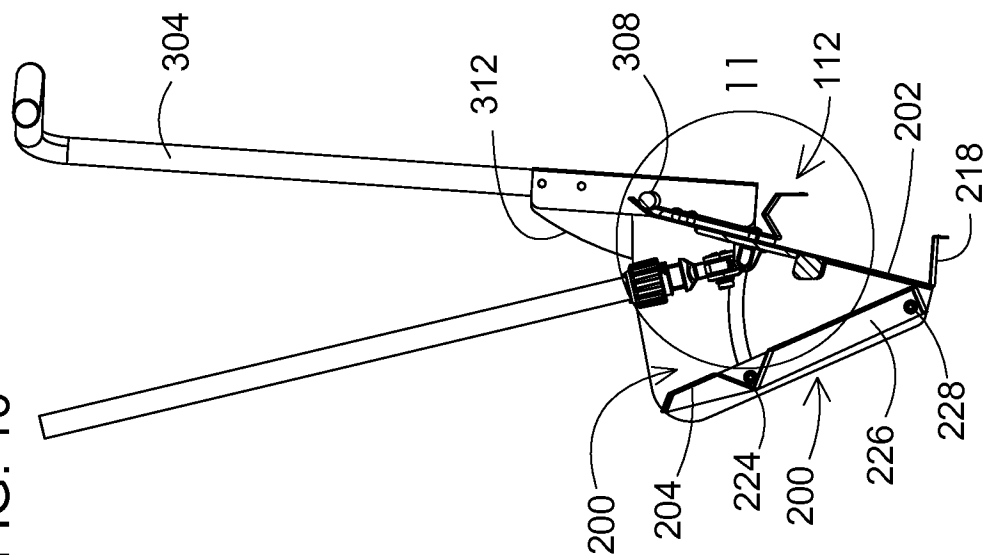
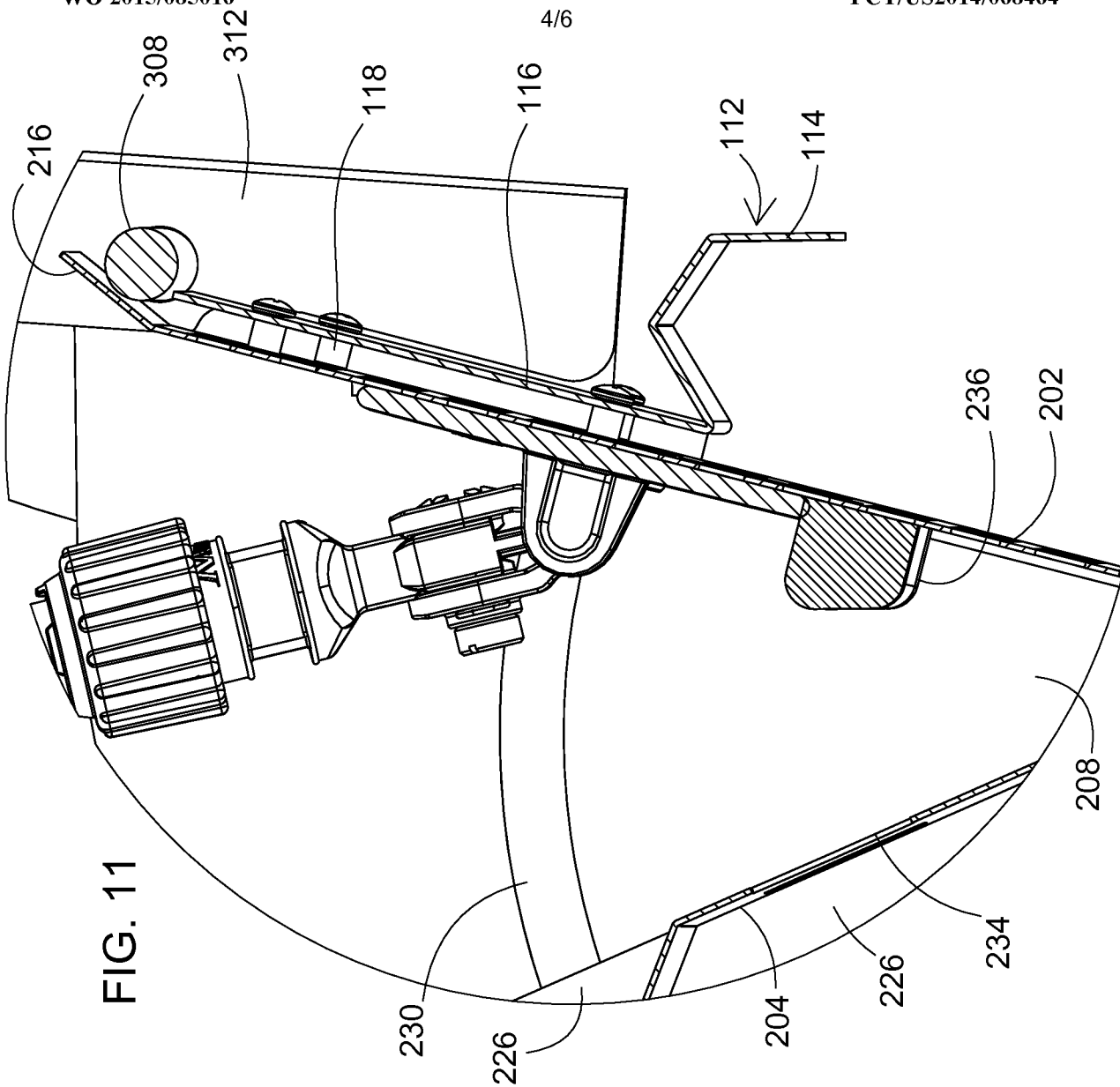
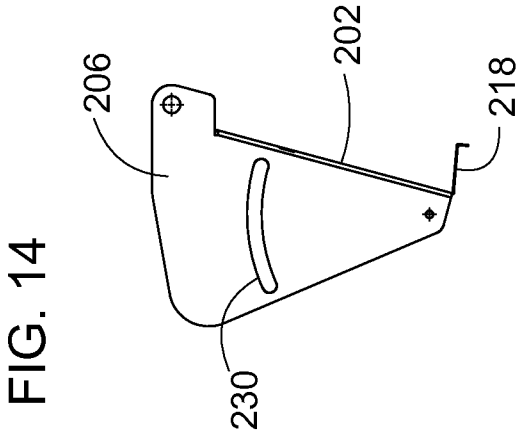
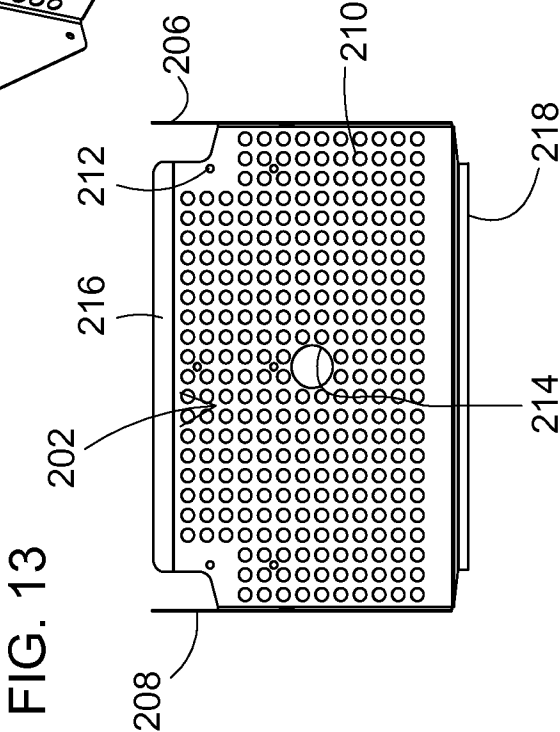
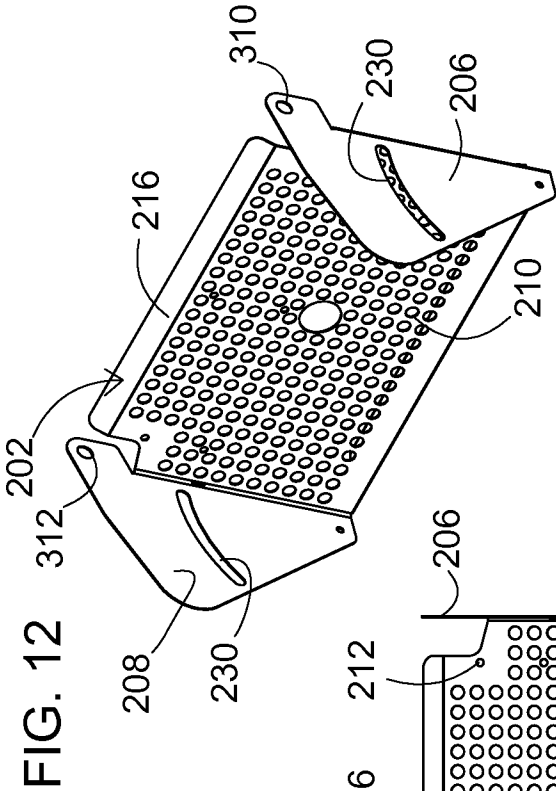
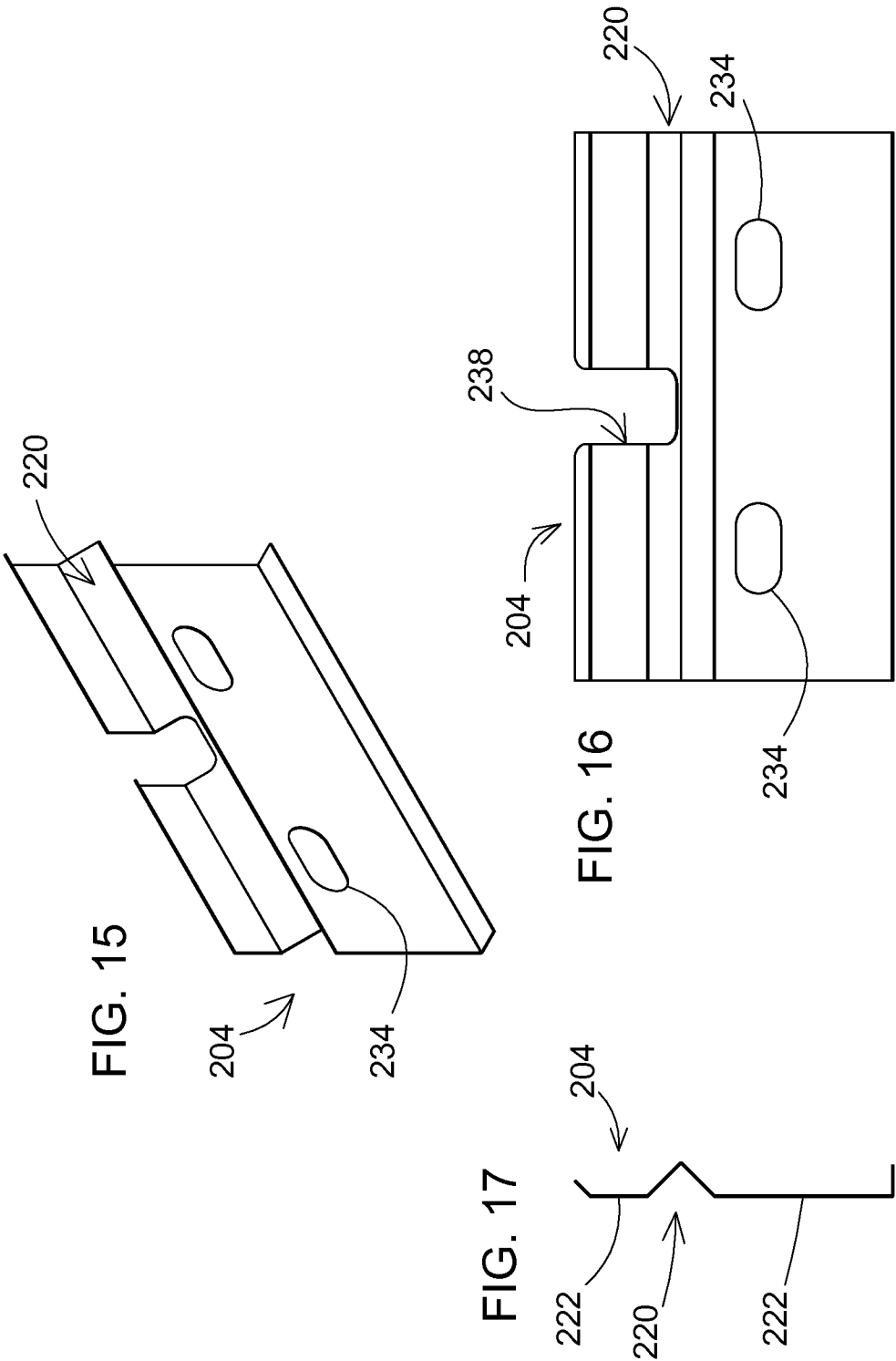


FIG. 11







INTERNATIONAL SEARCH REPORT

 International application No.
PCT/US2014/068464

A. CLASSIFICATION OF SUBJECT MATTER

A47L 13/59 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPOQUE X-FULL: TXTAU1, TXTCA1, TXTEP1, TXTGB1, TXTSG1, TXTUS0, TXTUS1, TXTUS2, TXTUS3, TXTUS4, TXTUS5, TXTWO1, WPI, EPODOC, class mark: A47L, keywords: mop, wipe, wring, actuate, handle, move, rotat, toggle, switch, shift, surface, plate, element, component, press, squeeze, position, locate, mount, limit, housing, chamber, envelop, opening, aperture, cut, etc.. Espacenet, and Google Patent searches: IPC mark: A47L; Applicant name: micronova; Inventor name: lecompte or stewart; KW: mop, wring, squeeze, press, tab, projection, protrusion, ridge, handle, lever, rotate, toggle, etc..

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	



Further documents are listed in the continuation of Box C



See patent family annex

* "A"	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 5 March 2015		Date of mailing of the international search report 05 March 2015	
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustalia.gov.au		Authorised officer Hong Yu AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. 0262837946	

INTERNATIONAL SEARCH REPORT C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		International application No. PCT/US2014/068464
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2006/0085939 A1 (PETNER) 27 April 2006 Abstract, Figures, para. [0030]	34-42, 44-49
X	US 5615446 A (CETNAROWSKI) 01 April 1997 Abstract, Figures, column 6	34-36, 42, 44-49
X	US 5070574 A (DELMERICO ET AL.) 10 December 1991 Abstract, Figures, column 4	34-36, 42, 44-49
X	US 2005/0204503 A1 (BURNS) 22 September 2005 Abstract, Figures, para. [0026]-[0027], [0034]	34-36, 42, 44-49
A	US 7383604 B2 (YOUNG) 10 June 2008 Abstract, Figure 5, column 4, lines 31-40	1-55
A	US 943650 A (CALLIS ET AL.) 21 December 1909 Figures, claims	1-55

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2014/068464**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
the subject matter listed in Rule 39 on which, under Article 17(2)(a)(i), an international search is not required to be carried out, including
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See Supplemental Box for Details

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

Supplemental Box**Continuation of: Box III**

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

- Claims 1-20, 31-36, 42-49 are directed to a wringer and a method of operating a wringer assembly. The feature of particular placement and moving direction of an actuating mechanism relative to two wringing elements/components, or specific structural characteristics of the actuating mechanism is specific to this group of claims.
- Claims 21-30, 50-55 are directed to a mop wringer and a method of operating a wringer assembly. The feature of a positioning element on a winging surface/element to fix a mop element above a bottom of the wringer is specific to this group of claims.
- Claims 37-41 are directed to a wringer. The feature of an opening in the surface of a pressure element between lateral edges thereof for receiving a structure on a mop or on the other pressure element is specific to this group of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention.

In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to all the claimed inventions and therefore cannot provide the required technical relationship. The only features common to all or part of the claimed inventions include wringing or pressure elements/components/surface, and mop. However it is considered that these features are generic in this particular art.

Therefore these common features cannot be a special technical feature. Hence there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied *a priori*.

The International Searching Authority believes that a search and examination for the second and third inventions will not involve more than negligible additional search and examination effort over that for the first invention and so no additional search fee is required in order to search and examine those inventions.

INTERNATIONAL SEARCH REPORT		International application No.	
Information on patent family members		PCT/US2014/068464	
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.			
Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	Publication Date	Publication Number	Publication Date
US 2006/0085939 A1	27 April 2006	US 2008282493 A1	20 Nov 2008
		US 7540063 B2	02 Jun 2009
US 5615446 A	01 April 1997		
US 5070574 A	10 December 1991	AT A68891 A	15 Apr 1996
		AT 401718 B	25 Nov 1996
		AU 634133 B2	11 Feb 1993
		AU 7278691 A	17 Oct 1991
		BR 9101417 A	26 Nov 1991
		CA 2040078 A1	11 Oct 1991
		DE 4109890 A1	17 Oct 1991
		DK 62591 A	11 Oct 1991
		FR 2660542 A1	11 Oct 1991
		GB 2242825 A	16 Oct 1991
		GB 2242825 B	13 Jul 1994
		IT MI910968 A1	11 Oct 1991
		IT 1245713 B	14 Oct 1994
		JP H0747047 A	21 Feb 1995
		NL 9100604 A	01 Nov 1991
US 2005/0204503 A1	22 September 2005		
US 7383604 B2	10 June 2008	US 7383604 B2	10 Jun 2008
		CA 2351278 A1	24 Aug 2002
		EP 1234537 A2	28 Aug 2002
		EP 1234538 A2	28 Aug 2002
		EP 1234538 B1	28 Jun 2006
		GB 2372430 A	28 Aug 2002
		GB 2372430 B	15 Jan 2003
		GB 2372437 A	28 Aug 2002
		GB 2372437 B	24 Nov 2004
		MX PA01007706 A	11 Aug 2004
		US 2002116780 A1	29 Aug 2002
		US 2008209664 A1	04 Sep 2008
US 943650 A	21 December 1909		
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.			

INTERNATIONAL SEARCH REPORT Information on patent family members		International application No. PCT/US2014/068464	
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.			
Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	Publication Date	Publication Number	Publication Date
End of Annex			
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001. Form PCT/ISA/210 (Family Annex)(July 2009)			