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United States Patent	12390086
Kind Code	B2
Date of Patent	August 19, 2025
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### Hand-held cleaning tool for front-loading washing machines

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#### Abstract

A hand tool designed to remove lint, dirt, moisture, mold, mildew, hair, and other loose objects from the gasket that is used to seal the access door of a front-loading washing machine and from between the flexible folds in the bellows assembly around the access door of a front-loading washing machine.

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<b>Family ID:</b>	<b>1000008762760</b>
<b>Appl. No.:</b>	<b>17/404888</b>
<b>Filed:</b>	<b>August 17, 2021</b>

#### Prior Publication Data

<b>Document Identifier</b>	<b>Publication Date</b>
US 20220053921 A1	Feb. 24, 2022

#### Related U.S. Application Data

us-provisional-application US 63067253 20200818

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#### Publication Classification

**Int. Cl.:** A47L25/00 (20060101); A46B5/02 (20060101); A46B15/00 (20060101); D06F39/06 (20060101)

**U.S. Cl.:**

CPC     **A47L25/00** (20130101); **A46B5/026** (20130101); **A46B15/0081** (20130101); **D06F39/06** (20130101); A46B2200/3073 (20130101)

## Field of Classification Search

**CPC:**     A46B (9/026); A46B (9/023); A46B (2200/30); A46B (2200/3073); A46B (2200/3033); A46B (15/0081); A46B (5/026); D06F (39/14); D06F (39/06); A47L (17/06); A47L (13/02); A47L (25/00); A47L (1/06)

**USPC:**   15/143.1; 15/236.07; 15/111; D4/138; D32/46; D32/51; 30/169

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## Background/Summary

CROSS REFERENCE TO RELATED APPLICATIONS (1) The present application claims priority from provisional patent application No. 63/067,253, filed on Aug. 18, 2020.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

(1) Not applicable.

(2) Not applicable.

#### FIELD OF THE INVENTION

(3) The subject invention relates generally to hand tools. More particularly, the subject invention relates to hand tools for cleaning the area behind the rubber seal/gasket of a front-loading washing machine.

#### BACKGROUND OF THE INVENTION

(4) Front-loading clothes washing machines (hereinafter referred to as “front-loaders”) have an inner clothes basket and outer tub that are mounted horizontally. Clothes are typically loaded into front-loaders through an access door at the front of the machine. Because the water level in front-loaders can rise above the access door, a gasket is typically used to tightly seal the access door shut during the wash cycle to prevent water dripping onto the floor. The access door is also typically locked shut with an interlocking device during the entire wash cycle, since opening the door while the machine in use could result in water gushing out onto the floor. In most machines, the interlock is usually doubly redundant to prevent either opening with the drum full of water or being opened during the spin cycle.

(5) In addition to the gasket, nearly all front-loaders use a folded flexible bellows assembly around the access door opening to keep clothing contained inside the inner basket during the tumbling wash cycle. If this bellows assembly were not used, then small articles of clothing, such as socks, could slip out of the inner basket near the access door and fall down the narrow slot between the outer tub and the inner basket, and possibly plug the drain and jam the rotation of the inner basket. The bellows assembly around the access door typically has many flexible folds to permit the inner basket to move separately from the access door during the high-speed spin cycle. These flexible folds can collect lint, dirt, hair, and moisture, resulting in mold and mildew growth, and a foul odor. The operating instructions for some front-loaders say that the bellows should be wiped down monthly with a strong bleach solution, while other instructions describe a special “freshening” cycle where the machine is run empty with a strong dosing of bleach.

(6) The present invention is a hand tool specifically designed to remove lint, dirt, moisture, mold, mildew, hair, and other loose objects from the gasket that is used to seal the access door of a front-loading washing machine and from between the flexible folds in the bellows assembly around the access door of a front-loading washing machine.

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## Description

#### BRIEF DESCRIPTION OF THE ATTACHED DRAWINGS

(1) The accompanying drawings are provided for the purpose of illustration only and are not intended as a definition of the limits of the present invention.

(2) FIG. 1 is an isometric view of one embodiment of the cleaning tool of the present invention.

(3) FIG. 2 is a side view of one embodiment of the cleaning tool of the present invention.

(4) FIG. 3 is an isometric view of another embodiment of the cleaning tool of the present invention.

(5) FIG. 4 is a side view of another embodiment of the cleaning tool of the present invention.

(6) FIG. 5 shows one embodiment of the cleaning tool of the present invention being used to clean a rubber gasket of a front-loading washing machine.

(7) FIG. 6 shows one embodiment of the cleaning tool of the present invention being used with a disposable cloth to clean a rubber gasket of a front-loading washing machine.

#### DESCRIPTION OF THE INVENTION

(8) While the present invention will be described with reference to preferred embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be

substituted for elements thereof without departing from the scope of the invention. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from the essential scope thereof. Therefore, it is intended that the present invention not be limited to the particular embodiments disclosed as the best mode contemplated for carrying out this invention, but that the invention will include all embodiments (and legal equivalents thereof).

(9) The present invention is a hand-held cleaning tool **10** for front-loading washing machines. As shown in FIGS. **1** through **4**, the cleaning tool **10** has an elongated handle **11** and an elongated head **12**. The handle **11** and head **12** can be constructed together in a single piece or they can be constructed separately and then joined together to form the cleaning tool **10**.

(10) The elongated handle **11** is preferably rigid to withstand the forces exerted on it by the user. The material of construction for the handle **11** can be any rigid material, such as metal, wood, hard plastic, and carbon fiber. The handle **11** is preferably ergonomically shaped for a comfortable grasp.

(11) As shown in FIGS. **1** through **4**, the elongated handle **11** preferably has a first end **13** and a second end **14**, with a grip **15** extending between the first end **13** and the second end **14**. The grip **15** can be bare or can be coated or wrapped with a gripping material, such as rubber, nitrile, silicone, and neoprene, to make the grip **15** more comfortable and easier to grasp. The length of the grip **15** is preferably four to six inches so that it fits in the palm of a user. The first end **13** of the handle **11** can be equipped with a knob **16**, as shown in FIGS. **1** and **2**, to make the handle **11** more comfortable and easier to grasp.

(12) The elongated handle **11** merges into the elongated head **12**, either as a single piece or as two separate pieces. When handle **11** and head **12** are two separate pieces, then the handle **11** is connected to the head **12** by snapping the two pieces together or by any other means known in the art.

(13) In the first embodiment (shown in FIGS. **1** and **2**), the elongated head **12** is preferably semi-flexible to allow the head **12** to be inserted between the inner clothes basket **27** and the gasket **28** or the folded flexible bellows assembly **29**, as shown in FIGS. **5** and **6**. The material of construction for the head **12** is preferably smooth to avoid scratching or damaging the inner clothes basket **27**, the gasket **28**, or the folded flexible bellows assembly **29**.

(14) In the first embodiment, the elongated head **12** has a first end **17** and a second end **18**, with a back **26** extending between the first end **17** and the second end **18**. The head **12** also has two sides **25** that extend between the first end **17** and the second end **18**. The length of the head **12** is preferably three to five inches. The first end **17** of the head **12** adjoins the second end **14** of the handle **11**. The second end **18** of the head **12** preferably ends in a tip **24**.

(15) As shown in FIGS. **1** and **2**, the elongated head **12** preferably has a horn **19** opposite the back **26**, where the horn **19** has a leading edge **42** that faces in the general direction of the second end **18** of head **12**. The leading edge **42** preferably extends laterally from one side **25** to the other side **25** of head **12**. The horn **19** has an inner surface **30** that extends laterally from one side **25** to the other side **25** of head **12** and extends longitudinally from the leading edge **42** to a notch **20**. The inner surface **30** of the horn **19** preferably is slightly concave.

(16) The elongated head **12** preferably has a first cleaning surface **21** that extends laterally from one side **25** to the other side **25** of head **12**. First cleaning surface **21** extends longitudinally from the notch **20** toward the second end **18** of the head **12** to a shoulder **22**. The first cleaning surface **21** of the head **12** preferably is substantially flat, with the flat surface being substantially parallel with the longitudinal axis of the cleaning tool **10**.

(17) The shoulder **22** extends laterally from one side **25** to the other side **25** of head **12**. Shoulder **22** extends from the first cleaning surface **21** substantially perpendicular to the first cleaning surface **21** and toward the back **26** of the head **12** to a second cleaning surface **23**. The shoulder **22** of the head **12** is preferably substantially flat.

(18) The second cleaning surface **23** extends laterally from one side **25** to the other side **25** of head

**12** and extends longitudinally from the shoulder **22** toward the second end **18** of the head **12** to the tip **24** of the head **12**. The second cleaning surface **23** of the head **12** preferably is slightly concave. (19) In the second embodiment (shown in FIGS. 3 and 4), the elongated head **12** has a first end **31** and a second end **32**, with a back **33** extending between the first end **31** and the second end **32**. The head **12** also has two sides **34** that extend between the first end **31** and the second end **32**. The length of the head **12** is preferably three to five inches. The first end **31** of the head **12** adjoins the second end **14** of the handle **11**.

(20) As shown in FIGS. 3 and 4, the head **12** of the second embodiment preferably has a horn **35** opposite the back **33**, where the horn **35** has a leading edge **36** that faces in the general direction of the second end **32** of the head **12**. The leading edge **36** preferably extends laterally from one side **34** to the other side **34** of head **12**. The horn **35** has an inner surface **37** that extends laterally from one side **34** to the other side **34** of head **12** and extends longitudinally from the leading edge **36** to a notch **38**. The inner surface **37** of the horn **35** preferably is slightly concave.

(21) The elongated head **12** of the second embodiment preferably has a first surface **39** that extends laterally from one side **34** to the other side **34** of head **12**. The first surface **39** also extends longitudinally from the notch **38** to the second end **32** of head **12**. The first surface **39** of the head **12** is preferably substantially flat, with the flat surface being substantially parallel to the longitudinal axis of the hand tool **10**.

(22) As shown in FIGS. 3 and 4, the elongated head **12** has a set of bristles **40** extending from the first surface **39** in a direction that is substantially perpendicular to the first surface **39**. The set of bristles **40** are preferably attached to the first surface **39** from a point near the leading edge **36** of the horn **35** to a point near the second end **32** of head **12**. The height of the set of bristles **40** can vary, but most of the set of bristles **40** have a height that is slightly less than the height of the horn **35**, and some of the set of bristles **40** near the second end **43** of head **12** have a height that is slightly more than the height of the horn **35**, as shown in FIG. 4.

(23) In use, the elongated handle **11** of the cleaning tool **11** is grasped by the user, and the elongated head **12** is inserted between the inner clothes basket **27** and the gasket **28**, or between the inner clothes basket **27** and the folded flexible bellows assembly **29**, with the horn **19** facing the inside of the inner clothes basket **27**, as shown in FIGS. 5 and 6. The head **12** is inserted in this manner until the notch **20** lodges against the outer rim **41** of the inner clothes basket **27**. With the notch **20** lodged against the outer rim **41**, the user can manipulate the cleaning tool **11** side-to-side so that the first cleaning surface **21**, the shoulder **22**, and the second cleaning surface **23** clean the gasket **28** or the folded flexible bellows assembly **29**. In the alternative embodiment, the user can manipulate the cleaning tool **11** side-to-side so that the set of bristles **40** clean the gasket **28** or the folded flexible bellows assembly **29**. The user can use the side-to-side action all the way around the outer rim **41** of the inner clothes basket **27** until the entire gasket **28** or the folded flexible bellows assembly **29** is clean.

(24) It is understood that one embodiment of the present invention has been disclosed by way of example and that other modifications and alterations may occur to those skilled in the art without departing from the scope and spirit of the present invention.

## Claims

1. A cleaning tool, comprising: (a) an elongated handle having a first end, a second end, and a grip extending between said first end and said second end of said elongated handle; (b) an elongated head having a first end, a second end, two sides, a back, a width measured from one of said two sides to the other of said two sides, and a tip at said second end of said elongated head, where said first end of said elongated head is longitudinally adjoined to said second end of said elongated handle, and where said two sides and said back of said elongated head extend from said first end of said elongated head to said second end of said elongated head; (c) a horn protruding from said

elongated head near said first end of said elongated head opposite of said back of said elongated head, where said horn has a leading edge that faces in the general direction of said second end of said elongated head, where said leading edge has a width that is substantially equal to said width between said two sides of said elongated head, where said horn extends longitudinally from said leading edge to a notch, where said notch is adjacent to said first end of said elongated head; and (d) a first cleaning surface that extends longitudinally from said notch toward said second end of said elongated head to a shoulder, where said shoulder extends from said first cleaning surface substantially perpendicular to said first cleaning surface and toward said back of said elongated head to a second cleaning surface, where said second cleaning surface extends longitudinally from said shoulder toward said second end of said elongated head to said tip of said elongated head, and where said second cleaning surface is concave and extends laterally between said two sides of said elongated head.

2. The cleaning tool of claim 1, where said grip is coated or wrapped with a gripping material, wherein said gripping material is rubber, nitrile, silicone, or neoprene.

3. The cleaning tool of claim 2, where said grip has a length of four to six inches.

4. The cleaning tool of claim 3, further comprising a knob at said first end of said elongated handle.

5. The cleaning tool of claim 4, where said horn has an inner surface that is concave, where said inner surface has a width that is substantially equal to said width between said two sides of said elongated head.

6. The cleaning tool of claim 5, where said first cleaning surface is substantially flat and extends laterally between said two sides of said elongated head.

7. The cleaning tool of claim 6, where said shoulder is substantially flat and extends laterally between said two sides of said elongated head.

8. A cleaning tool, comprising: (a) an elongated handle having a first end, a second end, and a grip extending between said first end and said second end of said elongated handle; (b) an elongated head having a first end, a second end, two sides, a back, a width measured from one of said two sides to the other of said two sides, and a tip at said second end of said elongated head, where said first end of said elongated head is longitudinally adjoined to said second end of said elongated handle, and where said two sides and said back of said elongated head extend from said first end of said elongated head to said second end of said elongated head; (c) a horn protruding a height from said elongated head near said first end of said elongated head opposite of said back of said elongated head, where said horn has a leading edge that faces in the general direction of said second end of said elongated head, where said leading edge has a width that is substantially equal to said width between said two sides of said elongated head, where said horn extends longitudinally from said leading edge to a notch, where said horn has an inner surface that is concave, where said inner surface of said horn has a width that is substantially equal to said width between said two sides of said elongated head, and where said notch is adjacent to said first end of said elongated head; (d) a first surface that extends longitudinally from said notch to said second end of said elongated head; and (e) a set of bristles extending from said first surface of said elongated head in a direction that is substantially perpendicular to said first surface of said elongated head, where said set of bristles are attached to said first surface of said elongated head from a first point near said leading edge of said horn to a second point near said second end of said elongated head.

9. The cleaning tool of claim 8, where said grip is coated or wrapped with a gripping material, wherein said gripping material is rubber, nitrile, silicone, or neoprene.

10. The cleaning tool of claim 9, where said grip has a length of four to six inches.

11. The cleaning tool of claim 10, further comprising a knob at said first end of said elongated handle.

12. The cleaning tool of claim 11, where a cleaning surface is substantially flat and extends laterally between said two sides of said elongated head.

13. The cleaning tool of claim 12, where most of said set, of bristles have a height that is lower

than said height of said horn and where some of set of bristles near said second end of said elongated head have a height that is higher than said height of said horn.

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