



(12) **United States Patent**
Cagliani et al.

(10) **Patent No.:** **US 9,410,279 B2**
(45) **Date of Patent:** **Aug. 9, 2016**

(54) **WASHING MACHINE WITH WATER STORAGE TANK**

(56) **References Cited**

(71) Applicant: **Whirlpool Corporation**, Benton Harbor, MI (US)

U.S. PATENT DOCUMENTS
2008/0092601 A1* 4/2008 Konides D06F 35/001
68/13 R
2012/0137447 A1* 6/2012 Aykroyd D06F 35/005
8/137

(72) Inventors: **Marco Cagliani**, Varese (IT); **Claudio Civanelli**, Travedona Monate (IT); **Daniele Martinello**, Besozzo (IT)

FOREIGN PATENT DOCUMENTS

(73) Assignee: **Whirlpool Corporation**, Benton Harbor, MI (US)

CN 201321557 Y 10/2009
DE 4409303 A1 * 11/1995
DE 4409303 A1 11/1995
DE 19530042 A1 2/1997
DE 202013100539 U1 3/2013
WO 2009141218 A1 11/2009

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 156 days.

OTHER PUBLICATIONS

(21) Appl. No.: **14/219,297**

European Search Report for Corresponding EP 13159873.2, Sep. 2, 2013.

(22) Filed: **Mar. 19, 2014**

(65) **Prior Publication Data**

US 2014/0283564 A1 Sep. 25, 2014

* cited by examiner

(30) **Foreign Application Priority Data**

Mar. 19, 2013 (EP) 13159873

Primary Examiner — Michael Barr
Assistant Examiner — Jason Riggleman

(51) **Int. Cl.**

D06F 39/00 (2006.01)
D06F 39/08 (2006.01)
F16K 11/056 (2006.01)
F16K 11/052 (2006.01)

(57) **ABSTRACT**

(52) **U.S. Cl.**

CPC **D06F 39/085** (2013.01); **D06F 39/006** (2013.01); **D06F 39/083** (2013.01); **F16K 11/052** (2013.01); **F16K 11/056** (2013.01)

A washing machine comprises a tub in which a drum is rotatably mounted, and a storage tank having a flow connection to the tub via a feeding line provided with a discharge pump and a three-port valve adapted to drive the flow to a drain or to the storage tank, rinsing fluid being stored in the storage tank for subsequent reuse. The washing machine further comprises an automatic valve connected to a drain line downstream the three-port valve and to an overflow line downstream the storage tank, said automatic valve being provided with means for avoiding any mixture of flows in the different configurations of the washing machine cycles.

(58) **Field of Classification Search**

CPC D06F 39/085
See application file for complete search history.

9 Claims, 4 Drawing Sheets

