



US008524327B2

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

(10) **Patent No.:** **US 8,524,327 B2**  
(45) **Date of Patent:** **Sep. 3, 2013**

(54) **LIQUID ADHESIVE DISPENSING SYSTEM**

(75) Inventors: **Paul David Wanthal**, Bartlett, IL (US);  
**Mutombo J. Muvundamina**,  
Minneapolis, MN (US); **James Haruch**,  
Naperville, IL (US)

(73) Assignees: **Spraying Systems Co.**, Wheaton, IL  
(US); **H.B. Fuller Company**, St. Paul,  
MN (US)

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 158 days.

(21) Appl. No.: **12/771,591**

(22) Filed: **Apr. 30, 2010**

(65) **Prior Publication Data**  
US 2010/0209592 A1 Aug. 19, 2010

**Related U.S. Application Data**  
(62) Division of application No. 11/153,265, filed on Jun.  
15, 2005, now Pat. No. 7,717,059.

(51) **Int. Cl.**  
**B05C 11/10** (2006.01)

(52) **U.S. Cl.**  
USPC ..... **427/427.2**; 427/421.1

(58) **Field of Classification Search**  
USPC ..... 427/427.2, 421.1; 118/320, 321,  
118/323, 669, 683, 712, 713  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

- 4,263,166 A 4/1981 Adams
- 4,462,543 A 7/1984 Yam
- 4,632,314 A \* 12/1986 Smith et al. .... 239/433
- 4,778,631 A \* 10/1988 Cobbs et al. .... 261/128

- 4,779,762 A 10/1988 Klein et al.
- 4,907,741 A 3/1990 McIntyre
- 4,911,956 A \* 3/1990 Gabryszewski et al. .... 427/424
- 5,429,840 A \* 7/1995 Raterman et al. .... 427/256
- 6,136,422 A 10/2000 Lichtenberg et al.
- 6,296,706 B1 10/2001 Dattilo
- 6,635,134 B1 10/2003 Lichtenberg et al.
- 2003/0127536 A1 7/2003 Donley et al.
- 2003/0139111 A1 7/2003 Kajander
- 2004/0255852 A1 12/2004 Briese et al.
- 2005/0023376 A1\* 2/2005 Anderson ..... 239/432

**FOREIGN PATENT DOCUMENTS**

WO WO 97/37838 A1 10/1997

\* cited by examiner

*Primary Examiner* — George Koch

(74) *Attorney, Agent, or Firm* — Leydig, Voit & Mayer, Ltd.

(57) **ABSTRACT**

A liquid adhesive dispensing system operable for more uniformly applying liquid adhesive foam onto moving substrates, notwithstanding changes in line speed, adhesive liquid flow rates, or foaming/atomizing air pressures. The illustrated liquid adhesive system includes a header having a plurality of air atomizing spray guns; the spray guns each having a respective variable speed positive displacement pump for directing a metered quantity of liquid adhesive from a liquid adhesive supply to the respective spray gun; and a control for controlling the operating speed of the positive displacement pumps in relation to the speed of the moving substrate and the foaming/atomizing air pressure to the spray guns in relation to the operating speed of the positive displacement pumps. The control further is operable for monitoring pressures across the positive displacement pumps for insuring the accurate direction of metered quantities of liquid to the spray guns. The spray guns are adapted for enhanced liquid adhesive foaming and atomization, and the header is convertible into a closed housing structure effective for containing cleaning and purge liquids during an automatically operable cleaning cycle of operation.

**9 Claims, 9 Drawing Sheets**

