UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

OMG, INC. and HANDY & HARMAN,	)	
	)	
Plaintiffs,	)	
	)	
v.	)	CIVIL ACTION NO. 12-cv-12080
	)	
ADCO GLOBAL, INC. and ADCO PRODUCTS, INC.;	)	JURY TRIAL DEMANDED
	)	
Defendants.	)	

COMPLAINT FOR PATENT INFRINGEMENT AND JURY DEMAND

Plaintiffs, OMG, Inc. and Handy & Harman, by and through their undersigned attorneys, hereby plead the following claims of patent infringement against ADCO GLOBAL, Inc. and ADCO Products, Inc. ("Defendants") and allege as follows:

PARTIES

1. Plaintiff OMG, Inc. ("OMG") is a corporation of the Commonwealth of Massachusetts with a principal place of business at 153 Bowles Road, Agawam, Massachusetts 01001.

2. Plaintiff Handy & Harman is a corporation of the state of New York with a principal place of business at 1133 Westchester Avenue, Suite N-222, White Plains, New York 10604.

3. Upon information and belief, Defendant ADCO Global, Inc. ("ADCO Global") is a corporation of the state of Delaware, with a principal place of business at 100 Tri Sate International, Suite 135, Lincolnshire, Illinois 60069.

4. Upon information and belief, Defendant ADCO Products, Inc. ("ADCO Products") is a corporation of the state of Michigan, with a principal place of business at 4401 Page Avenue, Michigan Center, Michigan 49254.

JURISDICTION AND VENUE

5. This is an action for patent infringement arising under the patent laws of the United States of America, Title 35 of the United States Code. This Court has subject matter jurisdiction over the matters pleaded herein under 28 U.S.C. §§ 1331 and 1338(a) in that this is a civil action arising out of the patent laws of the United States of America.

6. Upon information and belief, each Defendant has committed infringement of U.S. Patents 6,220,526; 8,113,385; 8,132,693; and 8,167,170 in the Commonwealth of Massachusetts, has contributed to such patent infringement in the Commonwealth of Massachusetts, and/or has induced others to commit such patent infringement in the Commonwealth of Massachusetts. Each Defendant, directly and/or through intermediaries, ships, distributes, uses, sells, offers for sale, and/or advertises (including via the provision of an interactive web page) its products in and/or into the Commonwealth of Massachusetts and this judicial district. This Court has personal jurisdiction over the Defendants because each Defendant has purposefully availed itself of the privileges of conducting business in the Commonwealth of Massachusetts and in this judicial district, and thus has enjoyed the privileges and protections of Massachusetts law, and Plaintiffs' causes of action arise directly from Defendants' business contacts in Massachusetts.

7. Venue is proper in the District of Massachusetts pursuant to 28 U.S.C. §§ 1391(b), and (c) and 1400(b).

COUNT 1: INFRINGEMENT OF U.S. PATENT NO. 6,220,526

8. The '526 patent, titled "Method and Device for Applying Adhesives," issued on April 24, 2001, and is the subject of an Ex Parte Reexamination Certificate, issued August 14, 2012. A true and correct copy of the '526 patent is attached hereto as Exhibit A and made part of this Complaint.

9. Jeff Johnson is the named inventor of the '526 patent. OMG owns by assignment the entire right, title, and interest in and to the '526 patent.

10. OMG is informed and believes, and thereon alleges, that Defendants' products sold under the name MILLENNIUM CYCLONE are low pressure adhesive pump carts, and that Defendants' products sold under the name MILLENIUM PG-1 are two-component polyurethane insulation adhesives packaged in a reducible volume container, these products individually or collectively referred to herein as "Accused Products." OMG is informed and believes, and thereon alleges, that sale and/or use of Accused Products directly, contributorily, and/or by inducement infringes one or more claims of the '526 patent.

11. OMG is informed and believes, and thereon alleges, that applicable requirements of 35 U.S.C. § 287 have been satisfied.

12. OMG is informed and believes, and thereon alleges, that Defendants have infringed, and continue to infringe, one or more claims of the '526 patent, in violation of 35 U.S.C. § 271, by, among other things, making, using, offering to sell, selling and/or importing Accused Products in and/or into the United States, without authority or license from OMG. Upon information and belief, Defendants have also contributed to the infringement of one or more claims of the '526 patent and/or actively induced others to infringe one or more claims of the '526 patent.

13. Defendants' acts of infringement have caused and will continue to cause substantial and irreparable harm to OMG for which there is no adequate remedy at law, unless enjoined by this Court.

14. As a result of the infringement of the '526 patent by Defendants, OMG has been damaged by Defendants' conduct. OMG is therefore entitled to such damages pursuant to 35 U.S.C. § 284 in an amount that presently cannot be pleaded but that will be determined at trial.

COUNT 2: INFRINGEMENT OF U.S. PATENT NO. 8,113,385

15. The '385 patent, titled "Adhesive Dispenser System," issued on February 14, 2012. A true and correct copy of the '385 patent is attached hereto as Exhibit B and made part of this Complaint.

16. Stanley W. Choiniere and Joshua S. Kelly are the named inventors of the '385 patent. Handy & Harman owns by assignment the entire right, title, and interest in and to the '385 patent.

17. Handy & Harman is informed and believes, and thereon alleges, that Defendants' products sold under the name MILLENIUM PG-1 are two-component polyurethane insulation adhesives provided in first and second packages, each having an outer container body with planar sides and an inner flexible enclosure, these products individually or collectively referred to herein as "Accused Products." Handy & Harman is informed and believes, and thereon alleges, that sale and/or use of Accused Products directly, contributorily, and/or by inducement infringes one or more claims of the '385 patent.

18. Handy & Harman is informed and believes, and thereon alleges, that applicable requirements of 35 U.S.C. § 287 have been satisfied.

19. Handy & Harman is informed and believes, and thereon alleges, that Defendants have infringed, and continue to infringe, one or more claims of the '385 patent, in violation of 35 U.S.C. § 271, by, among other things, making, using, offering to sell, selling and/or importing Accused Products in and/or into the United States, without authority or license from Handy & Harman. Upon information and belief, Defendants have also contributed to the infringement of one or more claims of the '385 patent and/or actively induced others to infringe one or more claims of the '385 patent.

20. Defendants' acts of infringement have caused and will continue to cause substantial and irreparable harm to Handy & Harman for which there is no adequate remedy at law, unless enjoined by this Court.

21. As a result of the infringement of the '385 patent by Defendants, Handy & Harman has been damaged by Defendants' conduct. Handy & Harman is therefore entitled to such damages pursuant to 35 U.S.C. § 284 in an amount that presently cannot be pleaded but that will be determined at trial.

COUNT 3: INFRINGEMENT OF U.S. PATENT NO. 8,132,693

22. The '693 patent, titled "Adhesive Dispenser System," issued on March 13, 2012. A true and correct copy of the '693 patent is attached hereto as Exhibit C and made part of this Complaint.

23. Stanley W. Choiniere and Joshua S. Kelly are the named inventors of the '693 patent. Handy & Harman owns by assignment the entire right, title, and interest in and to the '693 patent.

24. Handy & Harman is informed and believes, and thereon alleges, that Defendants' products sold under the name MILLENNIUM CYCLONE are low pressure adhesive pump carts,

and that Defendants' products sold under the name MILLENIUM PG-1 are two-component polyurethane insulation adhesives provided in first and second packages, each having planar sides and enclosing a bladder with a spout, these products individually or collectively referred to herein as "Accused Products." Handy & Harman is informed and believes, and thereon alleges, that sale and/or use of Accused Products directly, contributorily, and/or by inducement infringes one or more claims of the '693 patent.

25. Handy & Harman is informed and believes, and thereon alleges, that applicable requirements of 35 U.S.C. § 287 have been satisfied.

26. Handy & Harman is informed and believes, and thereon alleges, that Defendants have infringed, and continue to infringe, one or more claims of the '693 patent, in violation of 35 U.S.C. § 271, by, among other things, making, using, offering to sell, selling and/or importing Accused Products in and/or into the United States, without authority or license from Handy & Harman. Upon information and belief, Defendants have also contributed to the infringement of one or more claims of the '693 patent and/or actively induced others to infringe one or more claims of the '693 patent.

27. Defendants' acts of infringement have caused and will continue to cause substantial and irreparable harm to Handy & Harman for which there is no adequate remedy at law, unless enjoined by this Court.

28. As a result of the infringement of the '693 patent by Defendants, Handy & Harman has been damaged by Defendants' conduct. Handy & Harman is therefore entitled to such damages pursuant to 35 U.S.C. § 284 in an amount that presently cannot be pleaded but that will be determined at trial.

COUNT 4: INFRINGEMENT OF U.S. PATENT NO. 8,167,170

29. The '170 patent, titled "Adhesive Dispenser System," issued on May 1, 2012. A true and correct copy of the '170 patent is attached hereto as Exhibit D and made part of this Complaint.

30. Stanley W. Choiniere and Joshua S. Kelly are the named inventors of the '170 patent. Handy & Harman owns by assignment the entire right, title, and interest in and to the '170 patent.

31. Handy & Harman is informed and believes, and thereon alleges, that Defendants' products sold under the name MILLENIUM PG-1 are two-component polyurethane insulation adhesives provided in first and second packaging modules, each comprising a carton having a box-like shape and a water impermeable enclosure disposed in the carton and having a spout, these products individually or collectively referred to herein as "Accused Products." Handy & Harman is informed and believes, and thereon alleges, that sale and/or use of Accused Products directly, contributorily, and/or by inducement infringes one or more claims of the '170 patent.

32. Handy & Harman is informed and believes, and thereon alleges, that applicable requirements of 35 U.S.C. § 287 have been satisfied.

33. Handy & Harman is informed and believes, and thereon alleges, that Defendants have infringed, and continue to infringe, one or more claims of the '170 patent, in violation of 35 U.S.C. § 271, by, among other things, making, using, offering to sell, selling and/or importing Accused Products in and/or into the United States, without authority or license from Handy & Harman. Upon information and belief, Defendants have also contributed to the infringement of

one or more claims of the '170 patent and/or actively induced others to infringe one or more claims of the '170 patent.

34. Defendants' acts of infringement have caused and will continue to cause substantial and irreparable harm to Handy & Harman for which there is no adequate remedy at law, unless enjoined by this Court.

35. As a result of the infringement of the '170 patent by Defendants, Handy & Harman has been damaged by Defendants' conduct. Handy & Harman is therefore entitled to such damages pursuant to 35 U.S.C. § 284 in an amount that presently cannot be pled but that will be determined at trial.

PRAYER FOR RELIEF

WHEREFORE, Plaintiffs pray for entry of judgment against each Defendant as follows:

A. That Defendants have, directly, contributorily and/or by inducement of others, infringed one or more claims of the U.S. Patent 6,220,526 under 35 U.S.C. § 271;

B. That Defendants have, directly, contributorily and/or by inducement of others, infringed one or more claims of the U.S. Patent 8,113,385 under 35 U.S.C. § 271;

C. That Defendants have, directly, contributorily and/or by inducement of others, infringed one or more claims of the U.S. Patent 8,132,693 under 35 U.S.C. § 271;

D. That Defendants have, directly, contributorily and/or by inducement of others, infringed one or more claims of the U.S. Patent 8,167,170 under 35 U.S.C. § 271;

E. That Defendants provide to Plaintiffs an accounting of all gains, profits and advantages derived by each Defendant's infringement of the '526, '385, '693, and '170 patents, and that Plaintiffs be awarded damages adequate to compensate them for the wrongful

infringement by each Defendant, in accordance with 35 U.S.C. § 284, together with pre-judgment and post-judgment interest;

F. That Plaintiffs be awarded any other supplemental damages and interest on all damages, including, but not limited to attorneys fees available under 35 U.S.C. § 285;

G. That the Court permanently enjoin Defendants and all those in privity with them from making, having made, selling, offering for sale, distributing and/or using products that infringe any claim of the '526 patent, and from contributorily infringing any claim of the '526 patent, and from actively inducing others to infringe any claim of the '526 patent;

H. That the Court permanently enjoin Defendants and all those in privity with them from making, having made, selling, offering for sale, distributing and/or using products that infringe any claim of the '385 patent, and from contributorily infringing any claim of the '385 patent, and from actively inducing others to infringe any claim of the '385 patent;

I. That the Court permanently enjoin Defendants and all those in privity with them from making, having made, selling, offering for sale, distributing and/or using products that infringe any claim of the '693 patent, and from contributorily infringing any claim of the '693 patent, and from actively inducing others to infringe any claim of the '693 patent;

J. That the Court permanently enjoin Defendants and all those in privity with them from making, having made, selling, offering for sale, distributing and/or using products that infringe any claim of the '170 patent, and from contributorily infringing any claim of the '170 patent, and from actively inducing others to infringe any claim of the '170 patent; and

K. That Plaintiffs be awarded such other and further relief as this Court may deem just and proper, including but not limited to equitable relief and all remedies available at law.

DEMAND FOR JURY TRIAL

Pursuant to Federal Rule of Civil Procedure 38(b), Plaintiffs hereby demand a trial by jury on all issues triable to a jury.

Dated: November 7, 2012

Respectfully submitted,

OMG, INC. and HANDY & HARMAN

By their attorneys,

/s/ Patrick T. Clendenen

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EXHIBIT A

US006220526B1

(12) **United States Patent**
Johnson

(10) **Patent No.: US 6,220,526 B1**
(45) **Date of Patent: Apr. 24, 2001**

(54) **METHOD AND DEVICE FOR APPLYING ADHESIVES**

(75) Inventor: **Jeff Johnson**, Dalton, GA (US)

(73) Assignee: **Capitol USA, LLC**, Dalton, GA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/399,385**

(22) Filed: **Sep. 20, 1999**

(51) **Int. Cl.**[7] **B05B 11/02**
(52) **U.S. Cl.** **239/323**; 239/305; 239/327; 239/146; 222/95
(58) **Field of Search** 239/304, 305, 239/327, 320–323, 146; 222/95, 105

(56) **References Cited**

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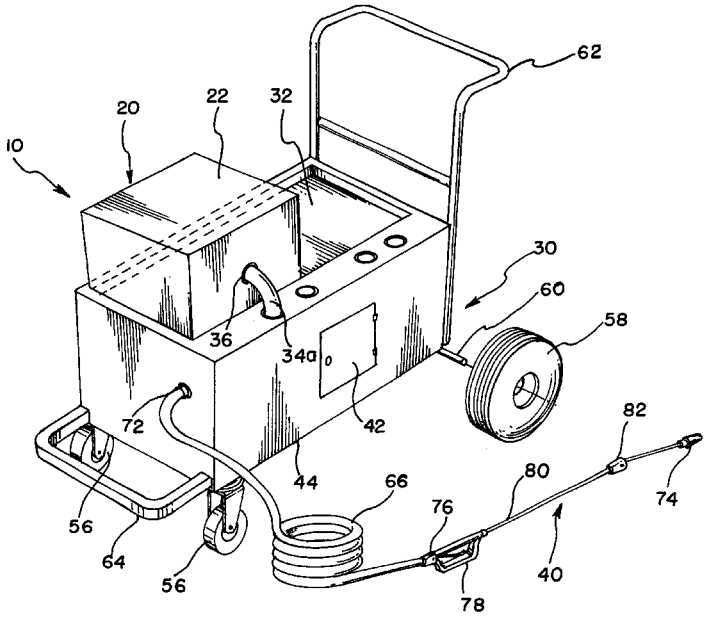
* cited by examiner

Primary Examiner—David A. Scherbel
Assistant Examiner—Dinh Q. Nguyen
(74) *Attorney, Agent, or Firm*—Miller & Martin LLP

(57) **ABSTRACT**

A method, system and sprayer for applying adhesives, or other coatings, is disclosed herein including a positive displacement pump having an inlet connected through a dispensing nozzle to a reducible volume container. The reducible volume container may be located in a more rigid container such as a cardboard box. As the positive displacement pump is operated, a suction on the collapsible container is drawn by the positive displacement pump. The pump may pump adhesives, or any other fluid material, preferably into an attached hose and through a bayonet type spray wand. The spray wand may have a replaceable tip to alter the spray coverage and may be activated by a trigger.

25 Claims, 3 Drawing Sheets



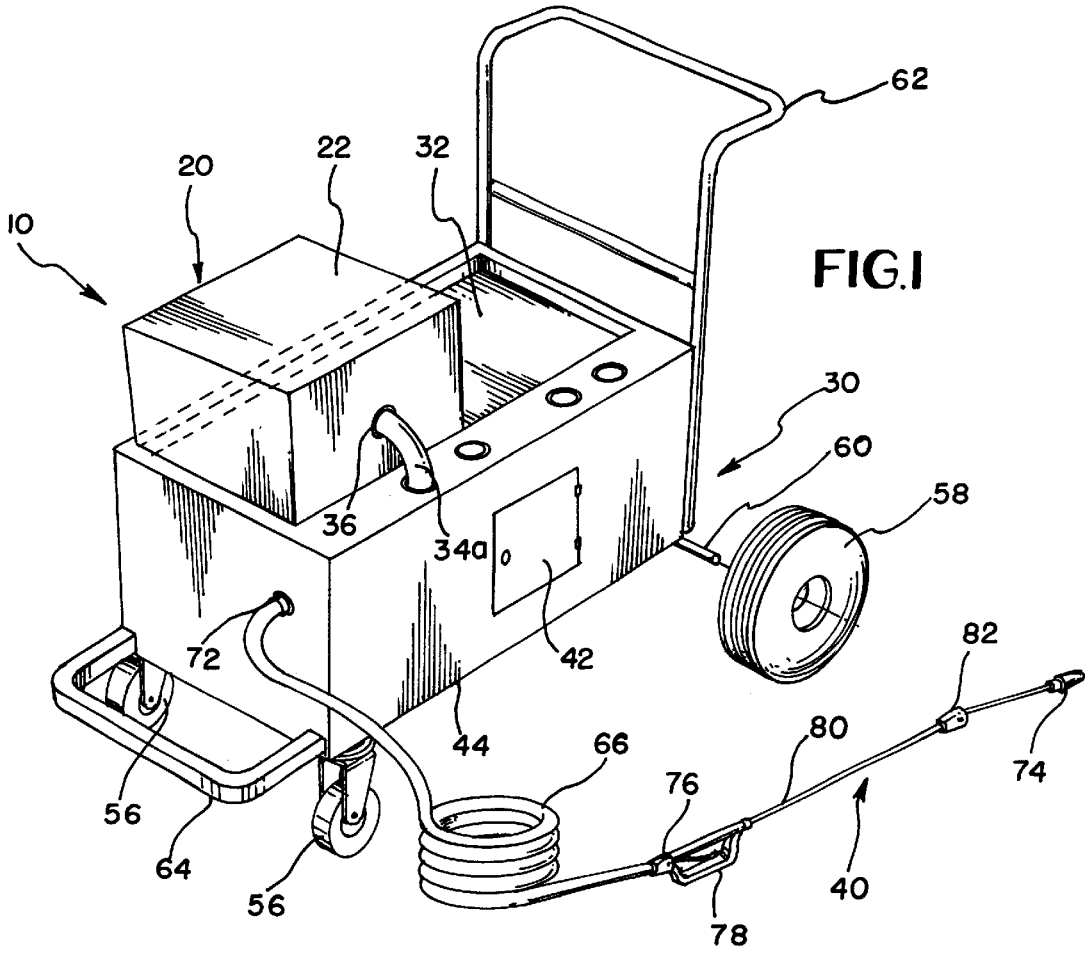

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FIG.1

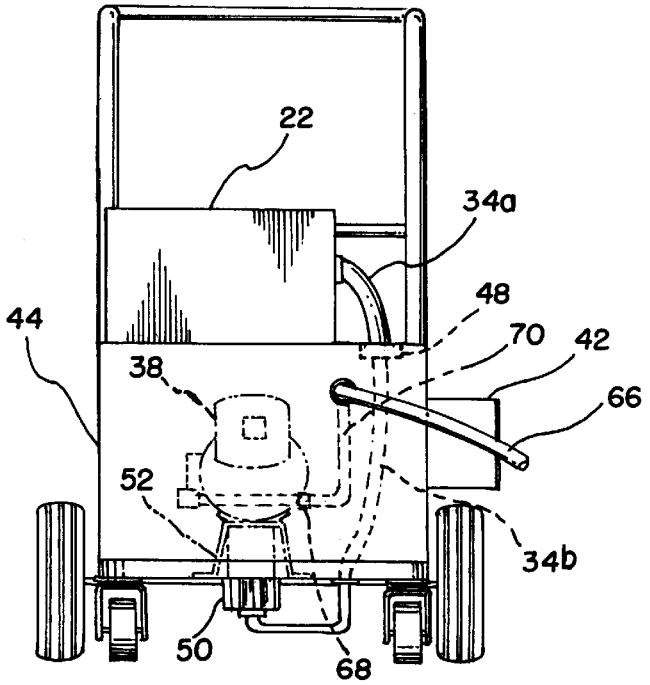
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FIG.2

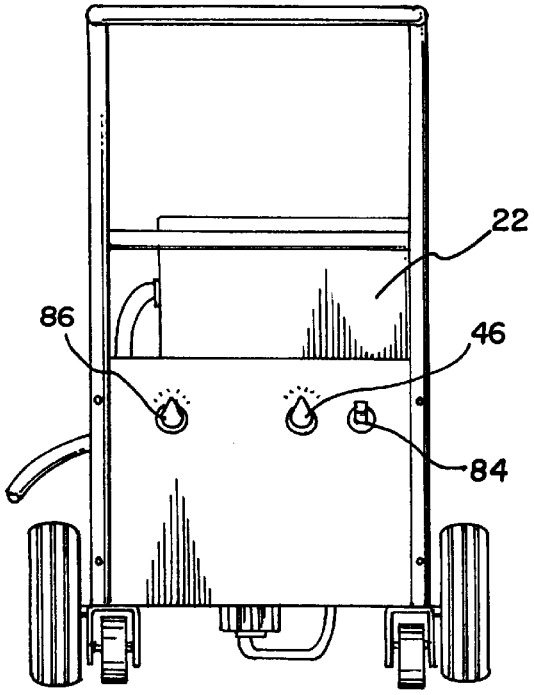


FIG. 3

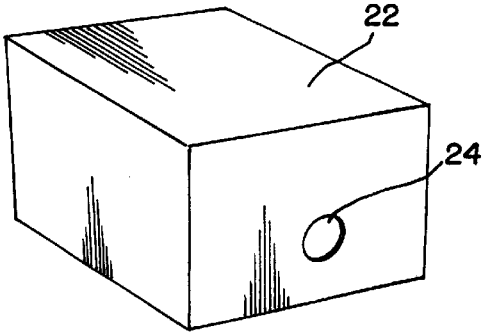


FIG. 4A

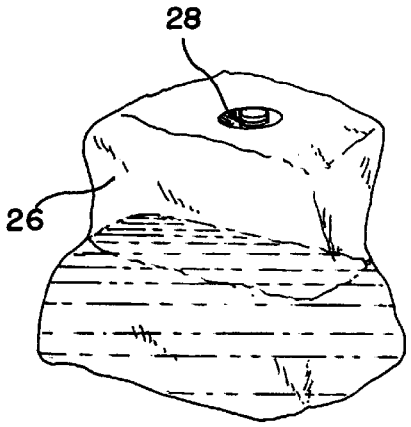


FIG. 4B

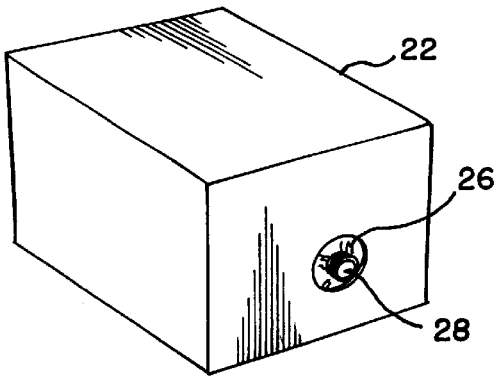


FIG. 4C

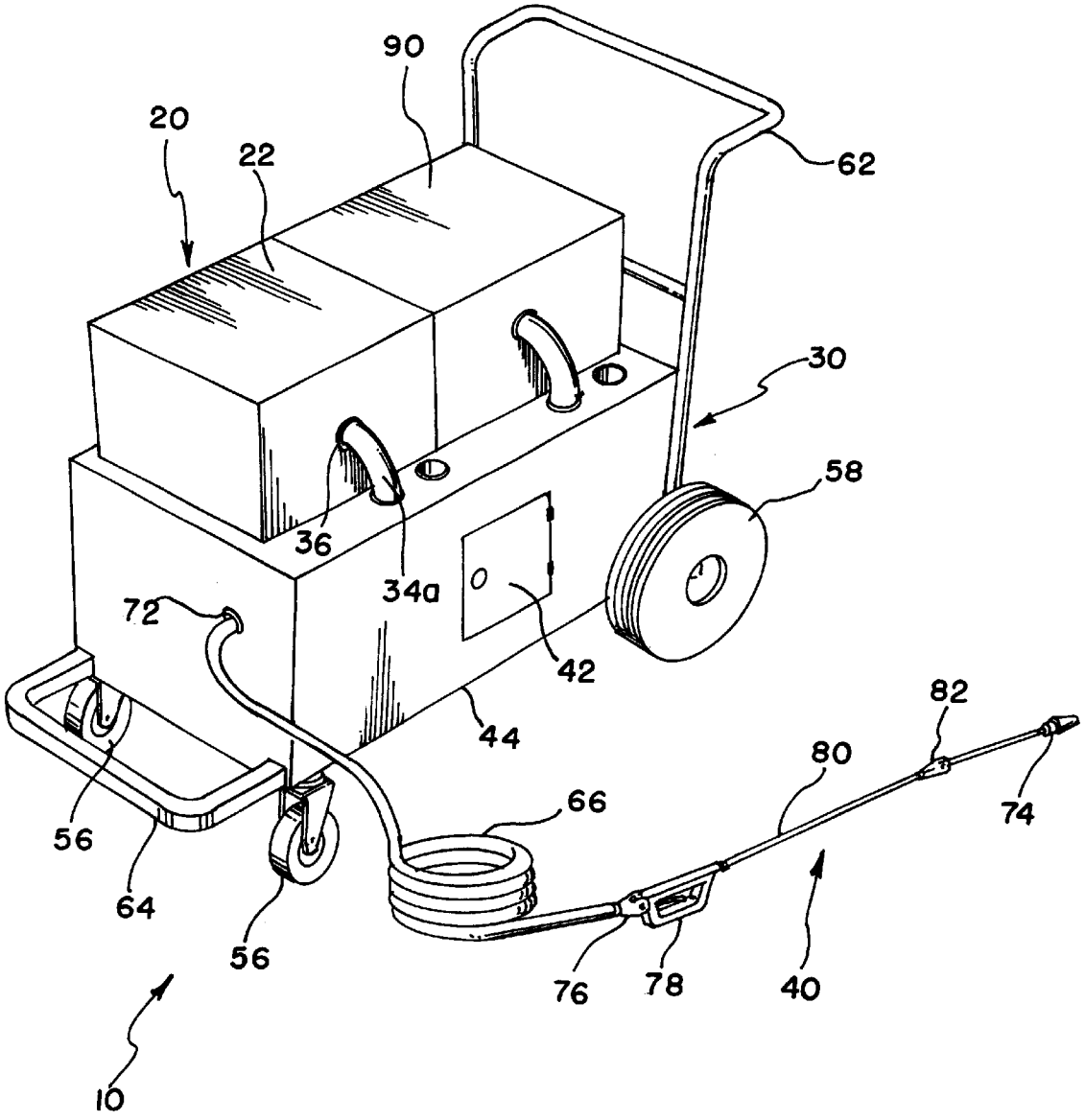


FIG. 5

METHOD AND DEVICE FOR APPLYING ADHESIVES

FIELD OF THE INVENTION

This invention relates to spraying devices, and in particular to a transportable adhesive sprayer system and method of applying adhesive, such as an adhesive utilized to adhere carpet to a floor.

BACKGROUND OF THE INVENTION

In the art of applying adhesives for adhering carpet to a flooring or other material, a number of methods and/or systems have been developed. One method of applying carpet adhesive to a floor is to remove a supply of adhesive from a pail, such as a 5-gallon pail, and spread manually with a trowel or other device. This method of applying adhesive is labor intensive and may involve additional clean-up efforts compared to more automated methods. Furthermore, the adhesive is not in a closed container or system during the application process whereby foreign material could end up in the adhesive mixture by falling in the pail or by being inadvertently introduced by the manual spreaders.

Carpet adhesives normally come in pails, such as 5-gallon pails. One company, Roberts Consolidated Industries, Inc., of California, makes a spray adhesive system which is capable of dispensing adhesives directly from such a pail. The Roberts Spray Adhesive System utilizes a sprayer having an electric motor capable of delivering approximately ½ gallon of adhesive per minute. The pump utilized for that sprayer may be varied in speed to control the flow. The pump has a suction including a suction tube which may be deposited within an open bucket situated on the floor below the pump. The pump discharge goes through a length of hose and a spray gun extension in order to spray the adhesive on the flooring surface. This sprayer system does not provide the capability of preventing contaminants from falling into the open bucket of adhesives. Additionally, the open bucket, when exposed to external atmospheric conditions over a period of time, will likely cause the adhesive to dry and/or cure in the bucket prior to being discharged through the sprayer gun. This may result in skinning in the bucket or clogging of parts of this spraying system. Additionally, significant clean up may be required after using this spraying system. Furthermore, the pail is not an integral part of the spray system so that each time a user desires to move the sprayer, the pail must be picked up and the sprayer moved and the user must be careful not to drip or spill the adhesive from the suction or from the pail. In short, the Roberts System is not a sealed system, is not as easily moved from room to room as desired, and may be messy to operate and clean.

A second type of adhesive spraying system known in the art is represented in a product built by the AAT Company. The AAT adhesive sprayer utilizes an air compressor which pressurizes a tank containing adhesives which are then forced through a nozzle in a sprayer. In general, pressurized systems are less favored for two principal reasons. First, in order to maintain a pressurized system, all of the seals and fittings need to be maintained so that they are capable of having an airtight seal. Secondly, in the event of a component failure, the potential for explosive adhesive release exists. One sprayer embodiment of the AAT variety utilizes an 8-gallon tank for the pressurized container. This pressurized tank becomes a pressure pot when filled with compressed air and adhesive. A small hole is located on top of the pressure pot for filling of the pressure pot with adhesives. This small hole is believed to make the filling of the pressure pot difficult, messy, and subject to spills. Once the adhesive is added to the tank, the tank is then closed and pressurized. During the filling of the container with the adhesive, the adhesives come into contact with the atmosphere and the sprayer device is not a closed system. Debris or other foreign matter may enter into the pressure pot during the filling of the adhesives and some amount of skinning or clogging may occur. Additionally, skinning, curing and clogging may occur within the pressurized pressure pot. Furthermore, this device utilizes a sprayer similar to one which may be found in an self-service car wash station. There is no capability for this sprayer to have its tips switched according to the needs of the user.

The X-lent Equipment Company also markets sprayers which operates similar to the AAT product. One version plugs into an air compressor, while the other version has an air compressor as part of the system. These two products both utilize air in a pressure pot to force adhesive through a hose assembly and then through a sprayer having a nozzle. Essentially the compressor builds up pressure within the pressure pot and then the adhesive is blown out the bottom. This system is not a closed system because the pressure pot must be opened and exposed to the atmosphere for adhesive to be added, presenting curing and contamination issues. The pressurized air within the pressure pot is also believed to present curing and contamination issues. The system also suffers from the disadvantages of pressurized systems.

In the pressure pot systems where the adhesive is then disposed through a hose, the fluid dynamics of the pressure pot and hose are believed to result in a loss of head along the length of the hose. Accordingly, some versions of the X-lent products have maximum hose lengths of 75 feet, and some have a maximum length of 100 feet. With a 5½ horsepower motor attached to an 11 or 13 cubic feet per minute compressor with all X-lent pressure pot types, it is believed that there will be a maximum hose length for effective use.

Another manufacturer of pressurized spraying systems is TACC International Corporation located in Rockland, Md. The TACC Systems utilize a pressurized containers, similar to a propane tank, which has adhesive therein. These aerosol spray cans and cylinders are advertised as being highly portable, requiring no outside air or power support and available in both returnable and disposable cylinders. Although the TACC adhesives spraying systems are completely closed systems as far as the user is concerned, they are not refillable or reusable by the user without first returning the containers to the manufacturer for refilling.

As previously discussed, most carpet adhesives are sold in five gallon pails. One company, the Taylor Company, has previously sold carpet adhesives in a cardboard box. However, within their cardboard box was a baggie containing the adhesive. In order to utilize the adhesive within the baggie, the baggie was pulled up and around the cardboard box and the adhesive was scooped out. In use, the adhesive was exposed to atmospheric curing and contamination. It is not believed that this system was, or is, commercially successful.

Accordingly, a need exists for a closed adhesive spraying system, sprayer and method. Furthermore, a need exists to have an adhesive container system adapted for use in an atmospherically closed environment.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the invention to provide an adhesive spraying system and method with a positive dis-

placement pump having a suction connected to a collapsible polyethylene container containing adhesives.

It is a further object of the invention to provide a portable spraying system.

It is another object of the invention to provide an adhesive spraying system which does not utilize a pressure pot.

It is a further object of the invention to provide an adhesive spraying system and method which prevents foreign matter and debris from contaminating the adhesive.

It is yet another object of the present invention to provide an adhesive spraying system to utilize at least two varieties of adhesives without extensive clean up to transition from one adhesive to another.

Still another object of the invention is the ability to utilize and store the adhesive sprayer system without clean up and then reutilize the sprayer system with minimal effort.

Accordingly, the method, system and sprayer disclosed herein include a positive displacement pump with the inlet connected to a dispensing nozzle of a reducible volume container. The reducible volume container may be located within a more rigid container such as a cardboard box. As the positive displacement pump is operated, a suction on the collapsible container is drawn by the positive displacement pump. The pump pumps the adhesive, or other material, preferably into an attached hose and through a bayonet type spray wand. The spray wand may have replaceable spray tips to alter the spray coverage, and may be activated by a trigger.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is perspective view of the preferred embodiment of the spraying system and spraying device according to the present invention with a portion of the top of the sprayer shown in phantom.

FIG. **2** is a front plan view of the sprayer with the interior shown in phantom.

FIG. **3** is a back plan view of the device shown in FIG. **2**.

FIG. **4**A is perspective view of a cardboard box for housing a flexible container as utilized in the preferred embodiment.

FIG. **4**B is a perspective view of a partially filled flexible container utilized with the preferred embodiment.

FIG. **4**C is a perspective view of the cardboard box of FIG. **4**A housing the flexible container of FIG. **4**B.

FIG. **5** is a perspective view of the sprayer similar to FIG. **1** with an additional adhesive container attached.

Repeat use of reference numerals in the present specification represents like, similar and analogous parts, future drawings of the present invention throughout several views.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is concerned with the application of coatings including adhesives, and more specifically to a method, system and sprayer for applying adhesive, or another material, to a surface. Accordingly, FIG. **1** depicts the adhesive application system **10** including an adhesive container **20**, a sprayer **30**, and a spray wand **40**.

The adhesive container **20** is preferably a collapsible type container. One example of a presently preferred container is the type manufactured by Hedwin Company of Baltimore, Md. This container features a cardboard box **22** shown in FIG. **4**A with an opening **24**. FIG. **4**B is a reducible volume container **26** which fits within the cardboard box **22** as is illustrated in FIG. **4**C. The reducible volume container **26** preferably has an opening, illustrated as a dispensing nozzle **28**, which may accept a screw on, or other type of cap and connectors. The reducible volume container **26** may be constructed of linear low and low density polyethylene ("LDP") manufactured in the form of a liner for use in the cardboard overpack **22**. The polyethylene container is designed to collapse as product is dispensed. The design is intended to allow product to flow from the polyethylene container in a continuous, uninterrupted stream. Alternatively, the reducible volume container **26** may be made of any other deformable material or materials. Additionally, the reducible volume container **26** could be constructed of more rigid materials such as a rigid tube with an end that moves within the tube to reduce the volume as the product is utilized, of the style typically employed with caulking compounds. Nevertheless, the cardboard box **22** with internal reducible volume container **26** has been found effective in storing and stacking the adhesive containers **20**. The cardboard box **22** may, or may not, be utilized depending on the particular application desired.

The preferred adhesive container **20** has about a five gallon capacity. Some pressure sensitive adhesives used with this system **10** have had an effective coverage area of approximately thirty or more square yards per gallon. Other adhesives such as vinyl adhesives and/or multipurpose adhesives may also be utilized with this spray system **10**. If multiple adhesive containers **20** are stacked on the sprayer **30** and connected to the pump, over 5000 square feet may be covered with adhesive without reloading.

The use of the reducible volume container **26** may allow the user to pump a container **26** dry without losing suction. If a plurality of reducible volume containers **26** are connected together, they may all be pumped from simultaneously. Alternatively, containers may be sequentially selected to be pumped from one at a time.

An adhesive container **20** is illustrated atop a portion of the sprayer **30** in FIG. **1**. Additionally containers **20** can be stacked alongside and on top of one another on the sprayer **30**. If more than one container is utilized, such as containers **20**, **90** illustrated in FIG. **5**, more than one adhesive type may be dispensed from the plurality of containers **20**, **90** without requiring cleaning of the system **10**. Although the container is illustrated in FIG. **1** as being at least partially held by recessed portion **32**, alternative and/or additional securing mechanisms including cinching belts, bungee cords and the like may be utilized. Alternatively, a user may not find it necessary to securely attach the container **20** to the sprayer **30**.

The adhesive container **20** is connected to the sprayer **30** by a supply tube **34**. A first end of the supply tube **34** with a connector **36** preferably attaches to the dispensing nozzle **28** of the reducible volume container **26**. The use of a T-joint on the first end of the supply tube **34** will permit it to be simultaneously attached to two adhesive containers **20**. The second opposed end of the supply tube **34** is preferably connected to the inlet of the pump **38** illustrated in FIG. **2**. In order to access the pump and tubing, an access panel **42** may be located on the housing **44**. The pump **38** is preferably a positive displacement type pump such as a piston pump spray pump manufactured by Air Lestro Duratech. A suitable pump utilizes a ¾ horsepower DC drive. A rheostat **46** may be utilized to control the pressure at the exit of the pump **38** as is illustrated in FIG. **3**.

A first portion of the supply tube **34***a* may be connected to a manifold **48**, shown in FIG. **2**, especially if a plurality

of containers **20**, **90** are connected to the sprayer **30**. The manifold **48** will allow a user to select which of the first tube pertains **34***a* and containers **20**, **90** are supplying adhesive through the second tube portion **34***b* to the pump inlet **50**. A manifold **48** could allow the use of quick disconnect connections from the supply tubes **34** to the manifold **48**. The manifold **48** may include valves and can be utilized to select the particular containers **20**, **90**.

In a preferred embodiment, the pump **38** utilizes a standard 115 VAC electrical connection and draws approximately six amperes of current. The sprayer **30** may be parked near an electrical outlet and then use the spray hose **66** to conduct adhesive to the locations for application of the adhesives. Alternatively an electrical cable of sufficient length may be utilized to locate the sprayer **30** a significant distance from an electrical outlet. Additionally, the pump **38** may be supplied with electricity from a generator or other source.

The pump **38** is shown mounted within the housing **44** of the sprayer **30**. One or more brackets **52** may secure the pump **38** to the housing **44**. The housing **44** of the sprayer **30** is mounted on a mobile base as illustrated in FIGS. **1–3** and **5**. This hose utilizes four wheels, however other base designs may also be utilized. The two front wheels shown are swivel coasters **56**. The two back wheels shown are tires, such as pneumatic tires **58**, mounted on axles **60**. A mobile base not only facilitates moving the sprayer about the buildings where adhesive is applied, but also in loading and unloading the sprayer on trucks for transportation between jobs.

A handle **62** connected to the mobile base and/or housing **44** is helpful in moving the sprayer **30**. A front platform **64** may serve as a bumper and may be utilized to store the spray wand **40** and hose **66** when moving the system **10**. The larger rear tires **58** have been found effective to allow users to roll the sprayer **30** on the back wheels like a dolly. Alternatively, the mobile base may be rolled on all four wheels. The housing **44** is preferably a sheet metal or plastic covering over a frame. Additionally, the housing **44** should be narrow enough to fit within most standard doorways.

The pump **38** is located within the housing **44** to minimize its exposure to dust and overspray. An on/off switch **84** may be utilized to turn the pump **38** on and off as shown in FIG. **3**. Additionally, the pump **38** may have an optional drive control **86**. This configuration for controls **80**, **46**, **84** has been found effective to minimize the cleanup required after using the system **10**. In testing the embodiment illustrated and described herein, the sprayer **30** was operated with a container **20** of adhesives. The sprayer **30** and adhesive container **20** were left attached and stored. Approximately three weeks later, the same container **20** of adhesives was utilized after removing a small amount of adhesive that had settled in the spray tip **74** of the spray wand **40**.

The pump outlet **68** is connected to outlet connector tube **70** as shown in FIG. **2**. The outlet connector tube **70** connects the pump outlet **68** to the spray hose **66** at outlet connection **72**. The connection **72** allows for the removal of the hose **66** and spray wand **40**.

The adhesive is preferably pulled by suction from adhesive containers **20** through supply tube **34** into the pump **38** and pumped out tube **70** to connection **72** and through the spray hose **66** to a spray nozzle. The spray hose **66** is preferably connected to a spray wand **40** at a connection, such as swivel connector **76**. From the connection, the adhesive enters into the spray wand **40** past trigger switch **78**. The trigger switch **78** may allow for controlling the flow of adhesive through the wand **40** or it may be an on/off type controller. From the trigger switch **78**, adhesive flows through the wand tube **80** into the spray tip **74**. The spray tip **74** may be permanently mounted to the wand tube **80** or may be removable and replaceable. In the removable configuration, a particular spray tip **74** may be selected for a particular application. Spray tips **74** having a 17 mm to 27 mm orifice have been found effective depending on the particular coverage sought by the user of the spray system **10**. At least a portion of the spray wand **40**, such as bend **82**, may be angled in order to direct spray at a particular desired location. The particular spray wand **40** utilized is of the bayonet type, however a pistol grip, other type wands **40** may be utilized.

One preferred method of operation is to place a container **20** having adhesive material within the reducible volume container **26** therein atop the sprayer housing **44**. The supply tube **34** is connected to the container **20** and the pump inlet **50**. The pump outlet **68** is connected to a hose **66** attached to a spray wand **40**. The pump **38** within the sprayer **30** will be turned on and the trigger **78** on the spray wand **40** will direct when and where the adhesive is sprayed. Other methods of operation will incorporate other features of the system **10** taught herein and will be obvious to one skilled in the art.

What is claimed is:

1. A method of applying an adhesive to a surface utilizing a reducible volume container having an interior with a first volume comprising the steps of:

a) connecting a dispensing nozzle of said reducible volume container to an inlet of a pump, said reducible volume container having a supply of an adhesive therein;

b) connecting the outlet of the pump to a spray device;

c) actuating the pump; and

d) spraying at least a portion of the adhesive out of the spray device, whereby after spraying said at least a portion of the adhesive from the spray device said reducible volume container having a second volume, said second volume being less than said first volume.

2. The method of claim **1** wherein the spray device further comprises a spray wand, and further comprising the step of activating a trigger on the spray wand to control the spray.

3. The method of claim **1** wherein the pump is a positive displacement pump.

4. The method of claim **1** wherein the reducible volume container is constructed at least in part of a low density polypropylene.

5. The method of claim **1** wherein the reducible volume container is substantially enclosed within a box.

6. The method claim **1** wherein the reducible volume container, the pump and the spray device comprise a substantially closed system.

7. The method of claim **1** wherein the reducible volume container, the pump and the spray wand prevent the adhesive from substantial exposure to atmospheric conditions until the adhesive is sprayed from the spray device.

8. The method of claim **1** wherein a second reducible volume container, is selectively connected to the inlet of the pump.

9. The method of claim **1** wherein the pressure within the reducible volume container is less than or equal to the pressure exterior to the reducible volume container.

10. An adhesive application system comprising:

a first reducible volume container having a dispensing nozzle and an interior with a supply of adhesive therein,

said interior of said first reducible volume container in closed and selectable communication through said dispensing nozzle with a spray device, whereby said first reducible volume container selectively communicates with an inlet of a pump, and the spray device communicates with an outlet of the pump.

11. The adhesive application system of claim **10** wherein the pressure within the reducible volume container is less than or equal to the pressure exterior to the first reducible volume container.

12. The coating application system of claim **10** wherein the first reducible volume container is comprised of a collapsible plastic material.

13. The coating application system of claim **12** wherein the first reducible volume container is substantially enclosed within a box.

14. The coating application system of claim **10** wherein the pump is mounted on a mobile base.

15. The coating application system of claim **10** further comprising a manifold intermediate the first reducible volume container and the pump inlet.

16. The coating application system of claim **15** further comprising a second reducible volume container having a supply of coating therein, said second reducible volume container in communication with the manifold through a dispensing nozzle.

17. The coating application system of claim **15** wherein the adhesives in the first and second reducible volume containers are chemically distinct.

18. The coating application of claim **10** wherein the first reducible volume container is in selective communication with the inlet of the pump.

19. The coating application system of claim **10** further comprising a second reducible volume container having a supply of coating therein, said second reducible volume container in selective communication with the inlet of the pump through a dispensing nozzle.

20. The coating application system of claim **19** wherein at least one valve is utilized to achieve the selective communication between the second reducible volume container and the inlet of the pump.

21. A container for adhesives comprising:

a reducible volume container having a supply of adhesive coating therein, said reducible volume container having a dispensing nozzle connectable to a pump, said dispensing nozzle adapted to seal in closed communication with a tube connected to the pump; and an outer box substantially enclosing said reducible volume container.

22. The container for adhesives of claim **21** wherein the reducible volume container is constructed at least in part of a low density polypropylene.

23. The container for adhesives of claim **21** wherein the dispensing nozzle is threaded.

24. The container for adhesives of claim **23** wherein the dispensing nozzle has male threads.

25. The container for adhesives of claim **24** wherein the dispensing nozzle has female threads.

* * * * *

US006220526C1

(12) EX PARTE REEXAMINATION CERTIFICATE (9185th)

United States Patent

Johnson

(10) Number: US 6,220,526 C1

(45) Certificate Issued: Aug. 14, 2012

(54) METHOD AND DEVICE FOR APPLYING ADHESIVES

(75) Inventor: **Jeff Johnson**, Dalton, GA (US)

(73) Assignee: **OMG, Inc.**, Agawam, MA (US)

Reexamination Request:
No. 90/011,868, Aug. 18, 2011

Reexamination Certificate for:

Patent No.:	**6,220,526**
Issued:	**Apr. 24, 2001**
Appl. No.:	**09/399,385**
Filed:	**Sep. 20, 1999**

(51) **Int. Cl.**

B05B 9/04	(2006.01)
B05B 9/00	(2006.01)

(52) **U.S. Cl.** **239/323**; 239/305; 239/327; 239/146; 222/95

(58) **Field of Classification Search** ..... None
See application file for complete search history.

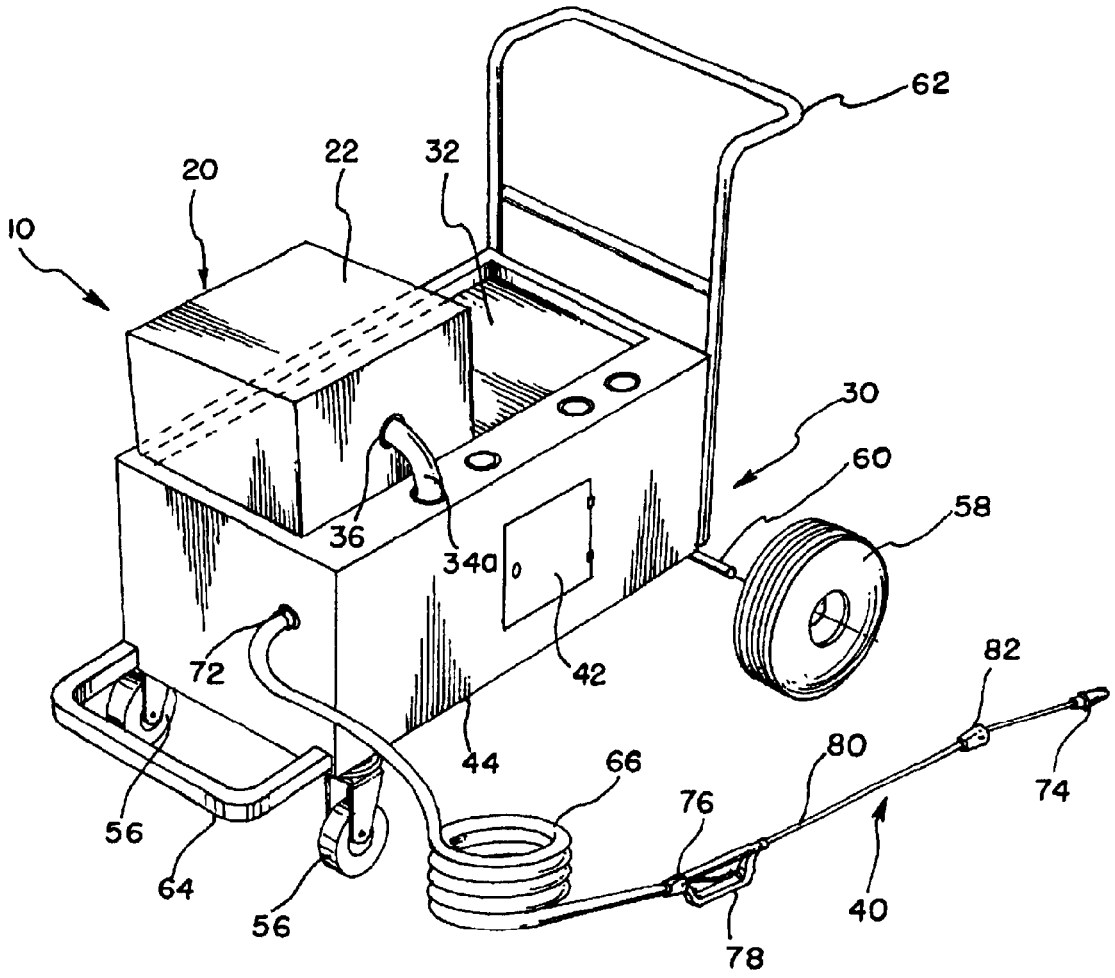
(56) **References Cited**

To view the complete listing of prior art documents cited during the proceeding for Reexamination Control Number 90/011,868, please refer to the USPTO's public Patent Application Information Retrieval (PAIR) system under the Display References tab.

Primary Examiner—Robert M. Fetsuga

(57) **ABSTRACT**

A method, system and sprayer for applying adhesives, or other coatings, is disclosed herein including a positive displacement pump having an inlet connected through a dispensing nozzle to a reducible volume container. The reducible volume container may be located in a more rigid container such as a cardboard box. As the positive displacement pump is operated, a suction on the collapsible container is drawn by the positive displacement pump. The pump may pump adhesives, or any other fluid material, preferably into an attached hose and through a bayonet type spray wand. The spray wand may have a replaceable tip to alter the spray coverage and may be activated by a trigger.



EX PARTE REEXAMINATION CERTIFICATE ISSUED UNDER 35 U.S.C. 307

THE PATENT IS HEREBY AMENDED AS INDICATED BELOW.

Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **21-25** are determined to be patentable as amended.

New claims **26-30** are added and determined to be patentable.

Claims **1-20** were not reexamined.

21. A **[**container**]** *device* for *applying* adhesives comprising:

a pump;

a tube connected to the pump;

a reducible volume container having a supply of adhesive coating therein, said reducible volume container having a dispensing nozzle **[**connectable to a pump**]**, said dispensing nozzle **[**adapted to seal**]** *sealed* in closed communication with **[**a tube connected to the pump**]** *said tube*; and an outer box substantially enclosing said reducible volume container.

22. The **[**container for adhesives**]** *device* of claim **21** wherein the reducible volume container is constructed at least in part of a low density polypropylene.

23. The **[**container for adhesives**]** *device* of claim **21** wherein the dispensing nozzle is threaded.

24. The **[**container for adhesives**]** *device* of claim **23** wherein the dispensing nozzle has male threads.

25. The **[**container for adhesives**]** *device* of claim **24** wherein the dispensing nozzle has female threads.

26. The device of claim 21 wherein the pump is mounted to a mobile base.

27. The device of claim 26 wherein the reducible volume container is supported on the mobile base.

28. An adhesive application system comprising:

a mobile base;

a pump mounted on said mobile base and having an inlet;

a reducible volume container having a dispensing nozzle and having a supply of adhesive therein;

an outer box substantially enclosing said reducible volume container; and

a tube connected to the inlet and sealed in closed communication with said dispensing nozzle.

29. The adhesive application system of claim 28 wherein the reducible volume container is supported on the mobile base.

30. An adhesive application system comprising:

a mobile base;

a pump mounted on said mobile base;

a reducible volume container having a dispensing nozzle and having a supply of adhesive therein;

an outer box substantially enclosing said reducible volume container; and

a tube sealed in closed communication with said dispensing nozzle and operatively connected to said pump to supply said adhesive to said pump.

* * * * *

EXHIBIT B

US008113385B2

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

(10) **Patent No.: US 8,113,385 B2**
(45) **Date of Patent: Feb. 14, 2012**

(54) **ADHESIVE DISPENSER SYSTEM**

(75) Inventors: **Stanley W. Choiniere**, Southwick, MA (US); **Joshua S. Kelly**, Longmeadow, MA (US)

(73) Assignee: **Handy & Harman**, White Plains, NY (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **13/179,150**

(22) Filed: **Jul. 8, 2011**

(65) **Prior Publication Data**

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Related U.S. Application Data

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(60) Provisional application No. 60/813,788, filed on Jun. 15, 2006.

(51) **Int. Cl.**
B67B 7/00 (2006.01)

(52) **U.S. Cl.** **222/1**; 222/94; 222/185.1

(58) **Field of Classification Search** 222/94, 222/105–107, 1, 129.1, 145.1–145.8, 181.1–181.3, 222/182–184, 185.1; 229/117.09–117.17, 229/117.27–117.35

See application file for complete search history.

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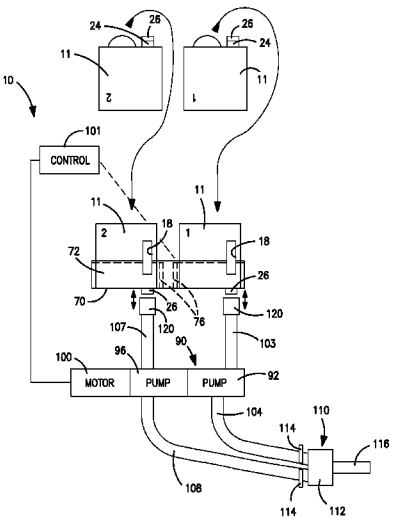
Primary Examiner — Lien Ngo
(74) *Attorney, Agent, or Firm* — Alix, Yale & Ristas, LLP

(57) **ABSTRACT**

A dispenser system employs a packaging module for use with moisture sensitive materials. The packaging module comprises an outer carton and an inner bladder, which is substantially impermeable to moisture and is filled with one part of an adhesive. The carton is loaded on a mobile cart and the one part adhesive is supplied to a pump/mixer without exposure to moisture in the atmosphere. The packaging and dispensing system can be used in conjunction with mechanized adhesive application equipment for the construction trades.

4 Claims, 8 Drawing Sheets



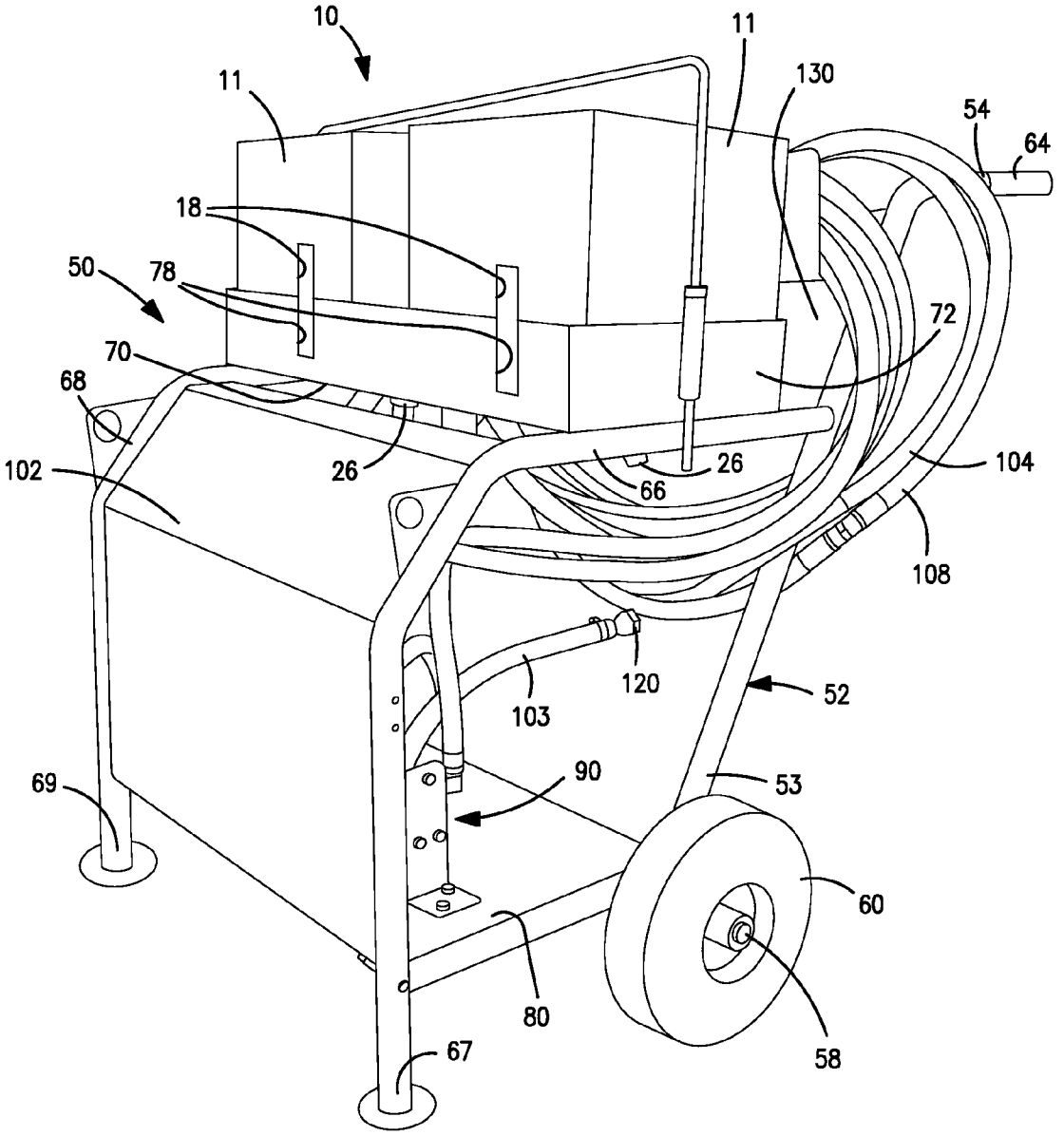

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FIG. 1

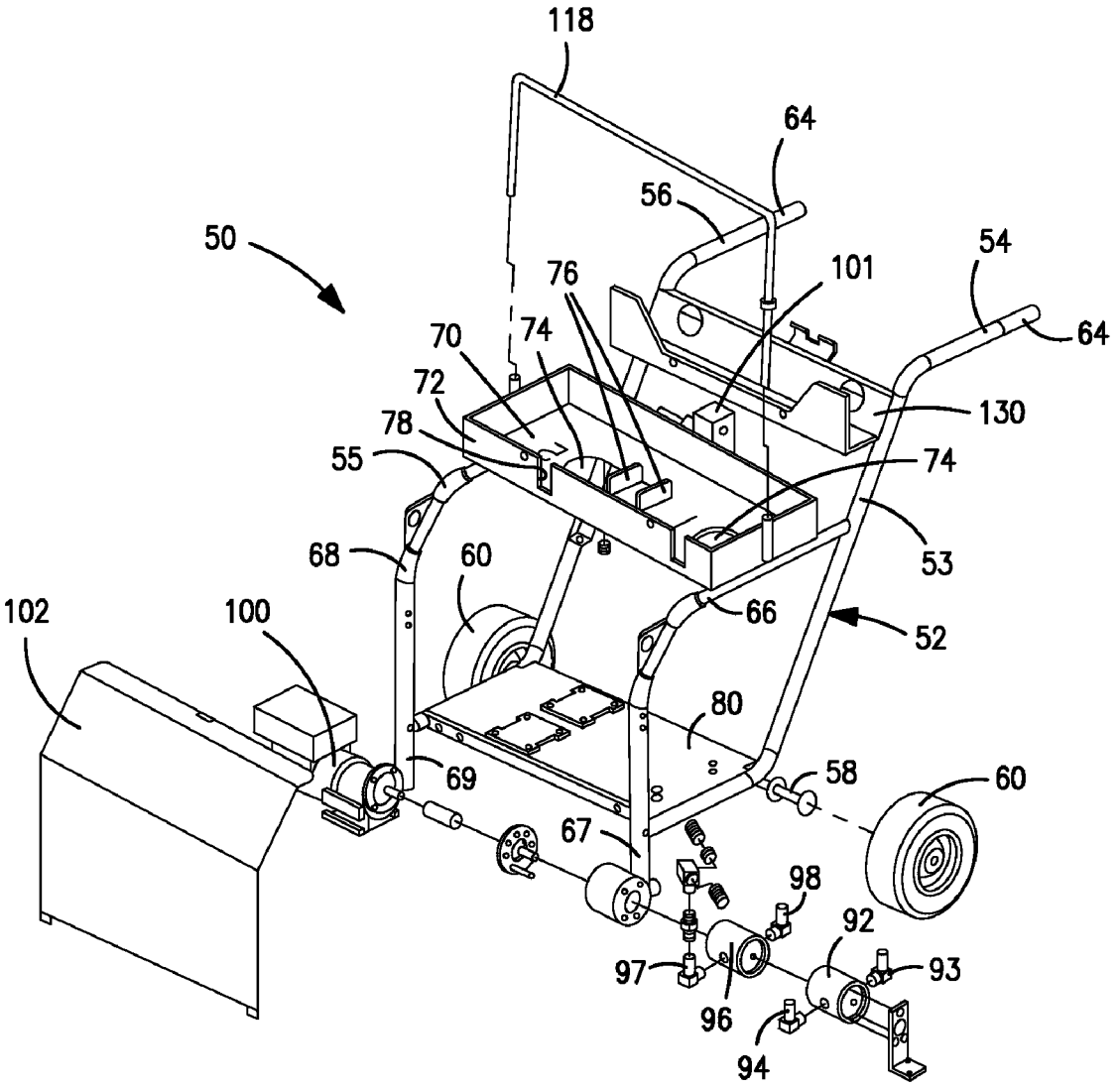
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FIG. 2

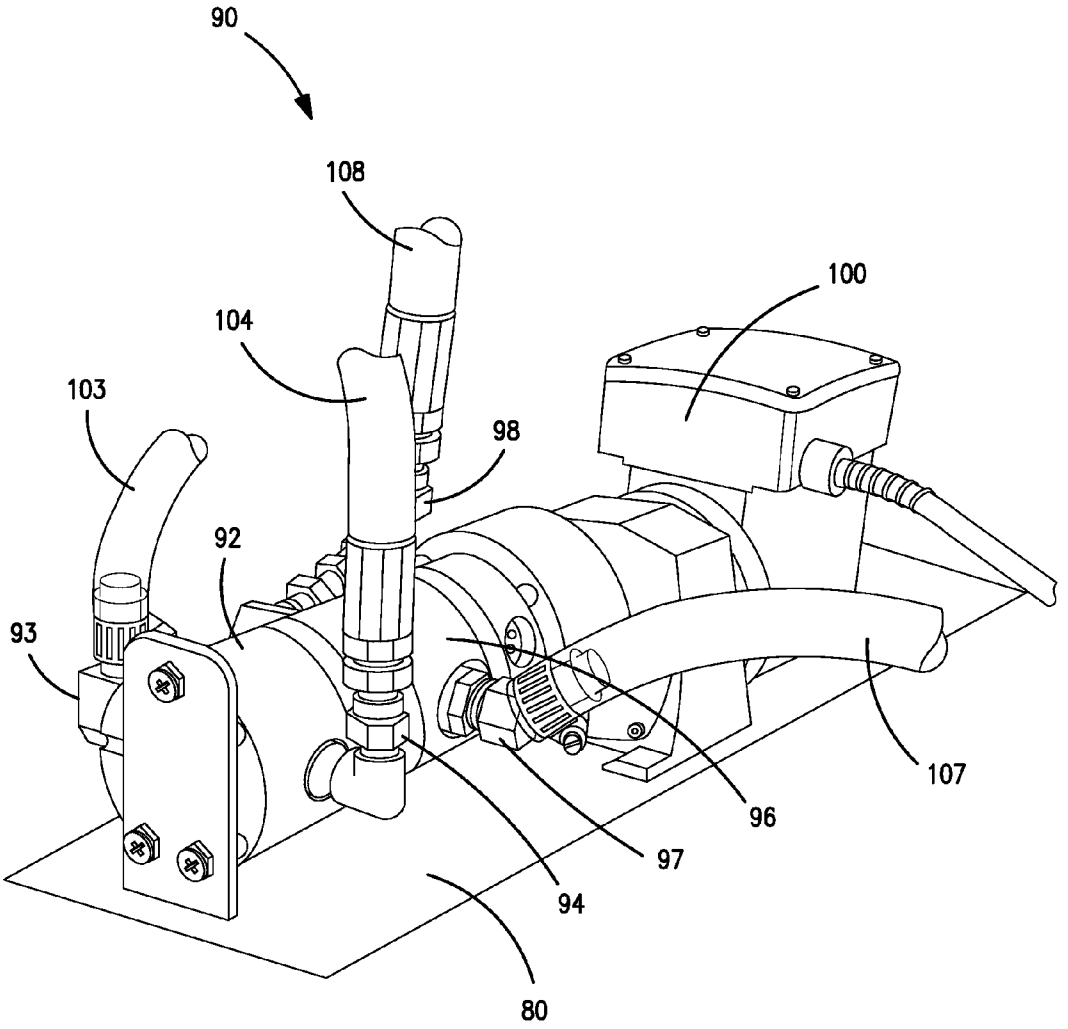


FIG. 3

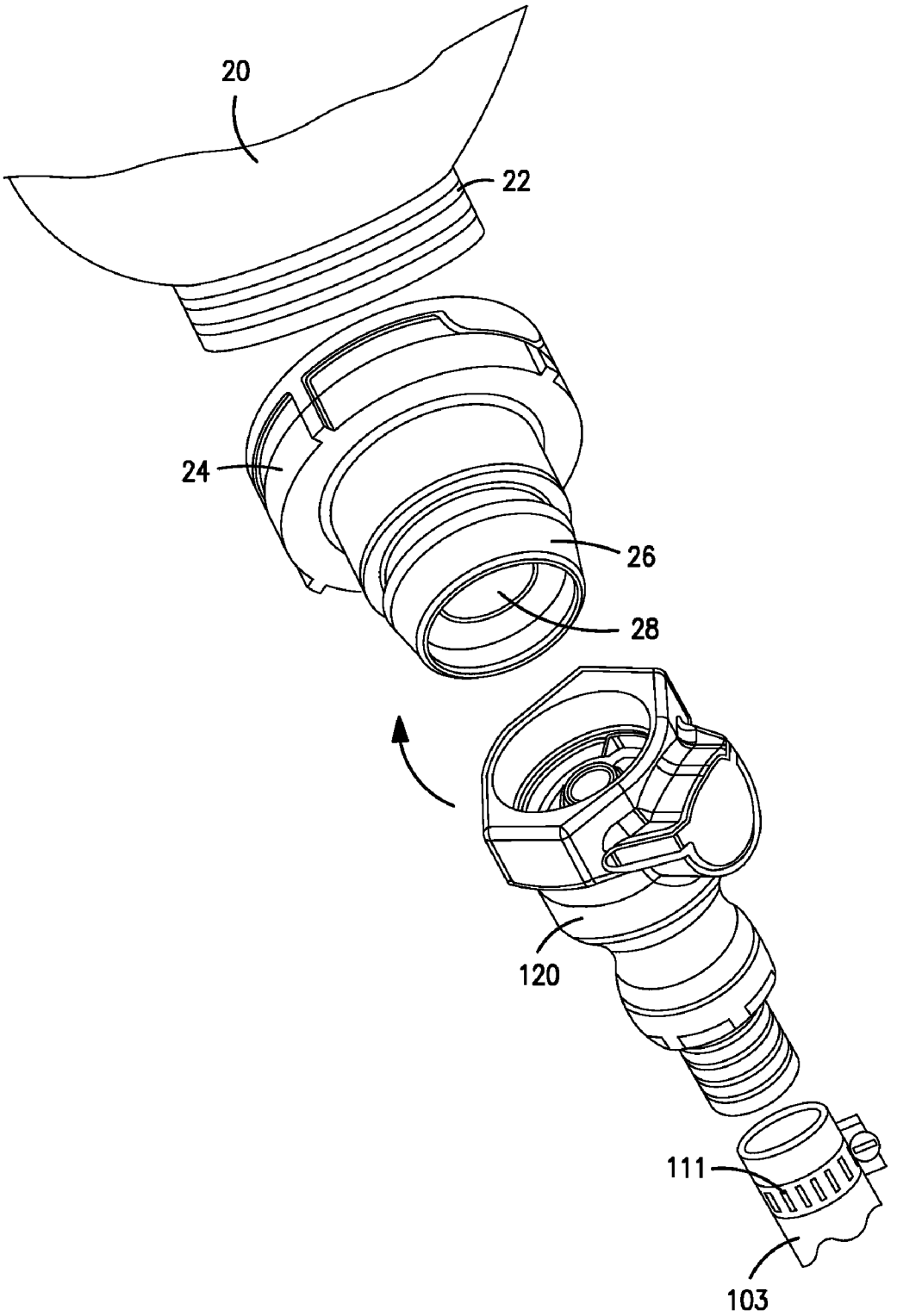
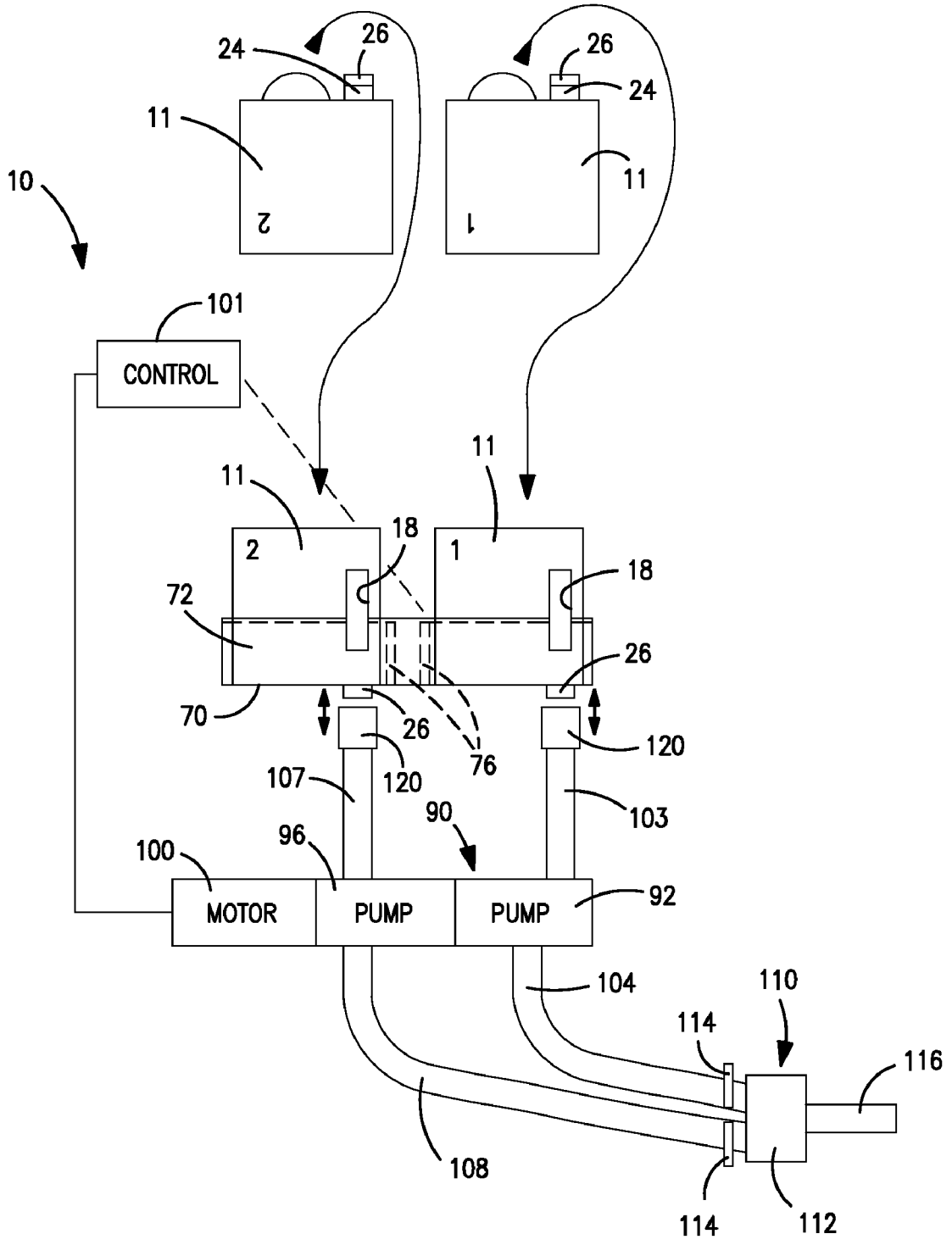


FIG. 4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76
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FIG. 5

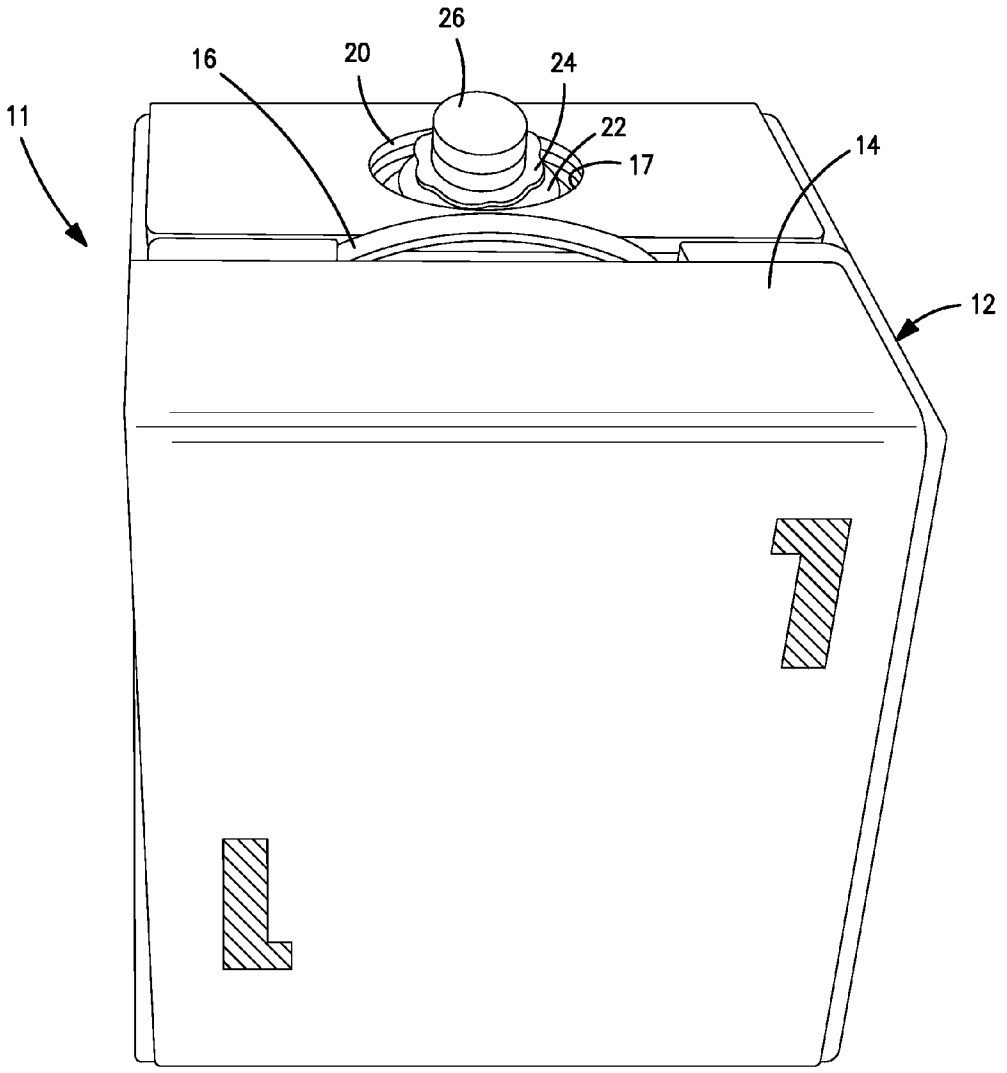

FIG. 6

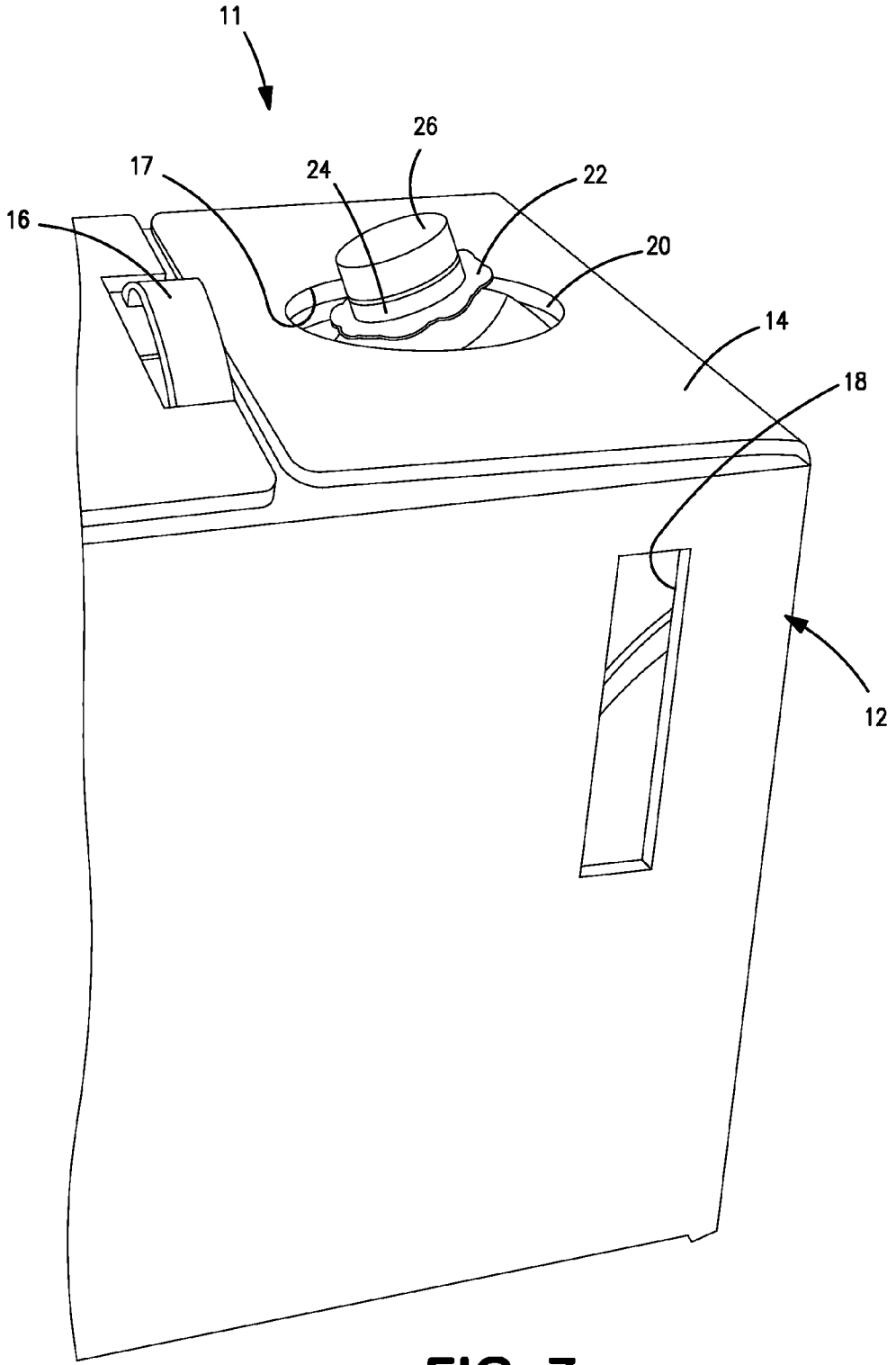

FIG. 7

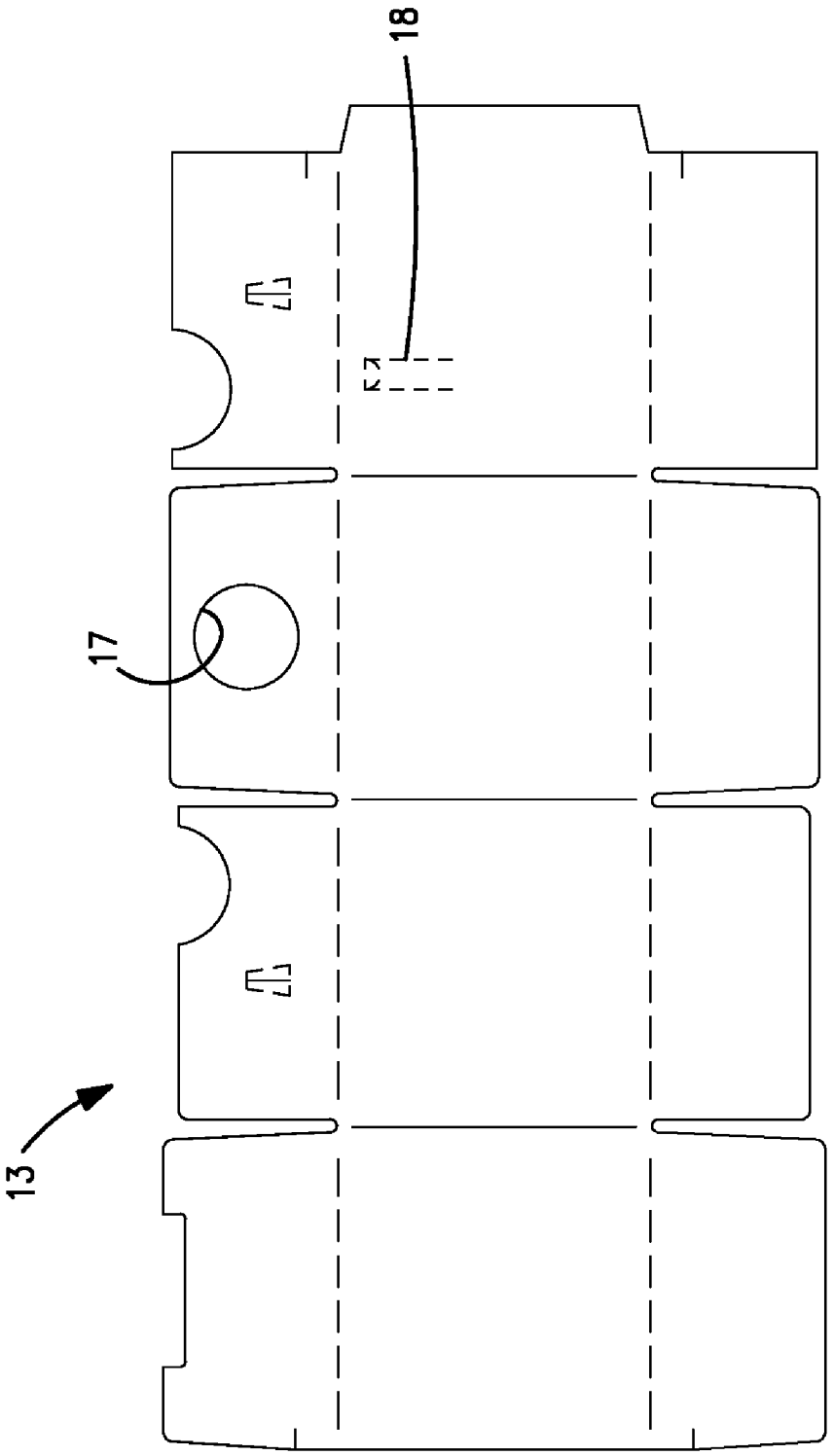

FIG. 8

ADHESIVE DISPENSER SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

This application is a divisional of U.S. application Ser. No. 11/818,451 filed on Jun. 14, 2007, which claims the priority of U.S. Provisional Application 60/813,788 filed on Jun. 15, 2006, the disclosure of which is incorporated by reference.

FIELD OF THE TECHNOLOGY

This application is directed to a packaging system for moisture-sensitive materials, and more particularly, to a dispensing system for moisture-sensitive adhesive materials used in the construction industry.

BACKGROUND OF THE INVENTION

In the construction industry, most moisture-sensitive materials, such as adhesive components, are packaged in a variety of sealable containers to prevent the contents from absorbing water from the atmosphere or moisture that collects on the surfaces of dispensing systems. Moisture commonly migrates into the fittings, nozzles and conduits of such dispensing systems. The dispensing system becomes clogged and the dispensing qualities are degraded to the extent that the system must be disassembled and cleaned. Significant costs and inefficiencies result from having to remove moisture which collects in the components of the dispensing system.

If the moisture-sensitive material is to remain viable over time, the user has to make sure that the packaging is tightly closed during periods of non-use. However, moisture-sensitive materials are inherently difficult to store after opening the original packaging, so in many cases, the unused portion is discarded after a construction job is completed. If moisture-sensitive materials are not discarded after opening the primary container, the material begins to chemically degrade, which can negatively affect the performance and physical properties of the remaining material. Additionally, the necessity of routinely discarding the unused portions of moisture-sensitive materials is costly, inconvenient, and environmentally unsound.

SUMMARY

An adhesive dispenser system for moisture-sensitive materials, such as construction adhesives, is provided. The adhesive dispenser system employs a packaging module which protects the contents therein from moisture in the atmosphere during use as well as during pre- and post-use storage and shipping. In one preferred embodiment, a packaging module comprises an outer container body or carton and an inner bag or bladder made of a water-impermeable flexible sheet material. The bladder has a truncated spout which is closed by a cap which is preferably valved. The bladder is filled with one part of an adhesive. The outer container body is preferably equipped with a handle, an opening to provide access to the spout and a window to allow inspection of the contents remaining in the bladder. The packaging module is adapted for efficient use with mechanical or motorized applicator systems.

The inner bladder receives and contains the moisture-sensitive material during shipping, use, and storage. It is also preferred that the spout has sidewalls extending upwardly to form a ridged neck portion and that the cap be threaded to the spout. Preferably, the spout and cap are manufactured from a durable plastic material. The spout can be closed or sealed either by use of a valved cap or similar sealing means. The spout via the cap is re-sealable after a first use such that the material therein remains in substantially the same condition as it was upon the first opening or first use of the material.

Briefly stated, one embodiment of a dispensing apparatus for a two-part adhesive comprises a cart having a tray. The carts mount a pump assembly which has a pair of inlets and a pair of outlets which communicate with a mixer/applicator gun. A first package encloses a bladder with an opening and which contains a first adhesive component. A second package encloses a bladder with a second opening and which contains a second adhesive component. The packages are each received on the tray. A conduit communicates via a first valve connector assembly between the opening of the package assembly and an inlet to the pump. A second conduit communicates via a second valve connector assembly between an opening of the second package and a second inlet to the pump. The first and second adhesive components are pumped by the pump assembly to a mixer/gun assembly and dispensed therefrom.

At least one package has a corrugated configuration. The package has a general rectangular shape with a handle mounted at one side. The package also has a window to permit inspection of the adhesive component contained in the corresponding bladder. The tray has a retention flange which surrounds the packages with the first and second packages being generally aligned in adjacent side disposition on the tray. At least one of the connector assemblies upon connection to the conduit does not permit exposure of the component in the bladder to the atmosphere. The connector assembly comprises a poppet valve and a snap-fit type connection. The snap-fit type engagement closes off the corresponding opening upon disconnecting the associated conduit from the opening. A hose connects the outlet to a mixer. The cart may further have a pair of wheels and handlebars for facilitating movement across a surface.

A method of dispensing a moisture sensitive adhesive with a mobile applicator system comprises providing a package having an outer container and an inner flexible enclosure that is substantially impermeable to moisture. The enclosure has an opening and is closed by a cap. The enclosure contains one part of an adhesive. The package is inverted. The package is then loaded onto a tray of the mobile applicator system. A conduit is connected for communication through the opening without exposing the one part to the atmosphere. The one part is mixed with the second part to form an adhesive and the adhesive is dispensed under pressure for application.

The conduit connecting step may employ lifting a valve to permit communication of one part into the conduit and implementing a snap fit connection between fittings of the cap and the conduit. The conduit may be disconnected from communication with the opening without exposing the one part in the inner enclosure to the atmosphere.

A packaging module comprises a carton having a box-like shape with one side having an opening. A water impermeable enclosure is disposed in the carton and has a spout alignable with or disposed in the opening and enclosed by a cap with a valve. A moisture sensitive part of the adhesive is disposed in the enclosure. A second side of the carton has a cutout portion defining a window. A handle extends from the first side. The carton preferably has a corrugated construction.

A better understanding will be obtained from the following detailed description of the presently preferred, albeit illustrative, embodiments of the adhesive dispenser invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of an adhesive dispenser system with portions of the system being removed;

FIG. **2** is an exploded view of a portion of the adhesive dispenser system of FIG. **1**;

FIG. **3** is an enlarged fragmentary perspective view of a portion of the adhesive dispenser system of FIG. **1**, viewed generally from the rear;

FIG. **4** is an enlarged fragmentary perspective view, partly exploded and partly in schematic, illustrating a portion of the adhesive dispenser system of FIG. **1**;

FIG. **5** is a schematic view illustrating the operation of an adhesive delivery system;

FIG. **6** is a frontal perspective view of a packaging module which may be employed in the adhesive dispenser;

FIG. **7** is a fragmentary perspective view of the packaging module of FIG. **6** from a second side thereof; and

FIG. **8** is a plan view of a pre-assembled form for an outer portion of the packaging module of FIG. **6**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An adhesive dispenser system is adapted for use with for moisture sensitive materials, such as two-part polyurethane adhesives used in the construction trades. For example, one commonly used chemical component for adhesive for which the system has particular applicability is methylene diphenyl diisocyanate (MDI)—which is moisture sensitive. The adhesive dispenser system, designated generally as **10**, employs at least one packaging module **11** which protects the pre-mixed components from moisture in the atmosphere, prevents the escape of volatile materials and ultimately substantially prevents, if not eliminates, crystallization in the pump, mixing components, conduits, delivery hoses and fixtures. The adhesive dispenser system **10** is used to facilitate the mixing and dispensing of moisture sensitive materials, as well as to ensure material integrity during shipping, pre-use storage and post-use storage.

With reference to FIGS. **6-8**, in one preferred embodiment, a packaging module unit **11** comprises an outer container body or carton **12** and an inner bag member or bladder **20** (only partially illustrated). The inner bladder **20** is made of a water-impermeable flexible sheet material and has a spout **22** which is closed by a threaded cap **24**. As described below, the cap **24** is valved and adapted for efficient connection with a conduit. The spout **20** may be truncated and have a reinforced ridged neck portion. The bladder is filled with one part of the adhesive (not illustrated) and, upon filling, substantially occupies the interior volume of the carton **12** and preferably closely conforms to the interior sides of the carton. The carton **12** is preferably a corrugated rigid or semi-rigid, box-like structure manufactured from a die cut panel **13** such as illustrated in FIG. **8**. The carton supports and protects the bladder **20** and its contents and also facilitates transportation and handling.

For storage and transportation purposes, the carton **12** includes a top side **14** to which a handle **16** is affixed. The carton also has an opening **16** in side **14** to provide access to the spout **22** and cap **24** of the bladder. Another side of the carton includes an elongated window **18** which extends to a short distance from the top surface to allow inspection of the contents of the bladder and, in particular, the amount of remaining material.

The inner bladder **20** receives and contains the moisture-sensitive material during shipping, use and pre- and post-use storage. Preferably, the inner bladder **20** is manufactured from a durable plastic material which is translucent or transparent to allow the contents to be viewed. It is preferred that the inner bladder **20** has a raised reinforced spout **22** equipped for threading with interior threads of the cap **24**. The spout **22** has sidewalls extending upwardly to form a ridged structure to an opening for the bladder. The cap **24** is pre-installed shortly after the adhesive components are placed in the bladder **20**.

In another preferred embodiment, the spout **22** is self-sealing either by use of a twist-cap, valve, or similar closing or sealing means. According to this embodiment, the spout **22** is repeatedly sealable so that the material therein remains in substantially the same condition as it was upon the first opening or first use of the material inside the bladder **20**.

In another embodiment, the carton **12** has an inside surface (not illustrated) that is covered or coated with a substantially water impermeable membrane so that the inside surface forms a substantially continuous liner member. According to this embodiment, the spout is sealed with the liner member so that any material contained within is substantially protected from moisture. Alternatively, the spout and the membrane defining the liner are manufactured as a one-piece unit.

With reference to FIGS. **1** and **2**, the packaging module **11** is especially adapted for incorporation and use in conjunction with a mobile dispenser cart **50**. The cart **50** includes a tubular support frame **52** which mounts the various dispenser components and component materials and provides mobility and efficient organization for the dispenser system. The frame **52** includes a pair of laterally spaced, angler tubular supports **53** and **55** which upwardly terminate in handlebars **54** and **56** and, at a lower rear location, receive an axle **58** for a pair of wheels **60**. The handlebars angle rearwardly at an upper rear location and include a pair of grips **64** to facilitate manual movement of the cart. A pair of laterally spaced angled tubular supports **66** and **68** extend forwardly from a medial location of the handlebars and extend downwardly to terminate at a pair of support legs **67** and **69**. The legs provide a stable support for the cart and allow the cart to be pivotally tilted for movement of the cart in hand-truck fashion whereby the wheels **60** support the cart and facilitate rolling movement.

A lateral, generally horizontal tray **70** is mounted to the support arms. The tray has a circumferential upstanding retaining flange **72**. The tray has openings **74** (FIG. **2**) as well as a pair of spaced centrally located upright position guides **76**. A pair of forward laterally spaced slots **78** are also formed in the retention flange **72**.

With additional reference to FIG. **3**, a shelf **80** extends between the supports **53** and **55** at a lower forward position adjacent the joining with supports **66** and **68** to form a generally horizontally disposed support platform. A dual inline geroter pump assembly **90** is mounted to the lower support platform. A pump unit **92** has an inlet **93** and an outlet **94**. Pump unit **96** (mounted in reverse relationship to pump unit **92**) has an inlet **97** and an outlet **98**. Inlets **93** and **97** communicate and connect via connectors with respective transparent conduits **103** and **107** which communicate with the packaging units **11** so that each part of the adhesive is generally supplied under gravity to the respective pump unit. Outlet fittings **94** and **98** connect with the dispensing/delivery hoses **104** and **108**. The pump units are driven by an electric motor **100** which is controlled by a control module **101** mounted to the rear of the tray. A skirt **102** may be mounted to the front of supports **66** and **68** to generally enclose and protect the various conduits and the pump assembly **90**.

With additional reference to FIG. **5**, the tray **70** is dimensioned and configured for receiving respective cartons **11** for the first and second parts of the adhesive. With additional reference to FIG. **4**, the cartons are configured for usage and connection by the cap **24** which has a projecting male fitting **26** and an intermediate poppet valve **28**. The carton is then

inverted so that the top side **14** rests on the tray. The carton is positioned so that the projecting male fitting **26** is received in the tray opening **74** or alignable therewith. The window **18** of the carton preferably essentially aligns with a slot **78** of the tray. An upstanding guide **76** engages one side of the carton to facilitate proper positioning. The same process is repeated for the carton **11** of the other part (for a two part adhesive).

An inverted U-shaped retention bar **118** is then mounted over the top of the tray and each module **11** to secure them in position. For applications where only one part is moisture sensitive, only one packaging module **11** may be employed.

Conduits **103** and **107** respectively extend from each inlet **93** and **97** and at an opposite end mount via a hose clamp **111** a female fitting **120**. Fitting **120** couples with the cap fitting **26** to provide an efficient snap fit connection and open the poppet valve **28** for providing a flow connection from the container bladder to the conduit without exposure to the atmosphere. The fittings which provide for the connection may be similar to that disclosed in U.S. Pat. No. 5,911,403, the disclosure which is incorporated herein by reference.

Hoses **104** and **108** connect with a mixing nozzle **110**. In one embodiment the hoses **104** and **108** are each approximately 30 feet in length. Each of the cartons may thus be connected to the pump assembly and ultimately the dispensing hoses **104** and **108** and the mixing gun assembly **110** without exposure to the atmosphere (and disconnected from the packaging module contents). The dispensing hoses **104** and **108** extend from the pump outlets **94** and **98** to provide a delivery conduit for delivery of the adhesive parts to the mixer **112**. The hoses each preferably have lever operated valve **114** at the input openings to the mixer **112**. Upon mixture of the constituent two parts, the adhesive is forced under pressure through a dispensing fixture or nozzle, such as representative wand **116** which includes a helical output path.

A bracket **130** may traverse at an upper location between the supports **53** and **55** to provide a retaining support for coiling the hoses **104** and **108** and/or power cords. The control module **101** including a switch is mounted at the rear of the tray to provide an accessible control unit for operating the pump assembly **90**.

It should be appreciated that in the event it is necessary to replace one of the components for the adhesive, replacement is relatively efficiently accomplished by disengaging the snap fit connectors **26**, **120** which, due to the poppet valve nature, does not expose the adhesive components to the atmosphere, and replacing the carton **11** with another suitable carton **11** as previously described. The pump assembly may be powered, in some instances by a gas engine (not illustrated).

What is claimed is:

1. A method of dispensing a moisture sensitive adhesive with a mobile applicator system comprising:

a. providing a first package and a second package, each package having an outer container body with a planar top side and a planar bottom side and an inner flexible enclosure that is substantially impermeable to moisture and has an opening enclosed by a cap located above said top side and contains one part of an adhesive;

b. inverting each said package;

c. loading each said package onto a tray of said mobile applicator system so that each said top side rests on said tray in surface-to-surface relationship and each cap is located below the tray;

d. connecting a conduit for communication through each said opening without exposing each said one part to the atmosphere;

e. mixing each said part to form an adhesive; and

f. dispensing said adhesive.

2. The dispensing method of claim **1** wherein each said cap has a fitting with a valve and step d further comprises:

lifting each said valve to permit communication of said one part into said conduit.

3. The dispensing method of claim **1** wherein step d further comprises implementing a snap-fit connection between said fittings of each said cap and mixing conduit.

4. The method of claim **1** further comprising disconnecting each said conduit from communication through each said opening without exposing said one part in said inner enclosure to the atmosphere.

* * * * *

EXHIBIT C

US008132693B2

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

(10) **Patent No.: US 8,132,693 B2**
(45) **Date of Patent: Mar. 13, 2012**

(54) **ADHESIVE DISPENSER SYSTEM**

(75) Inventors: **Stanley W. Choiniere**, Southwick, MA (US); **Joshua S. Kelly**, Longmeadow, MA (US)

(73) Assignee: **Handy & Harman**, White Plains, NY (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **13/179,115**

(22) Filed: **Jul. 8, 2011**

(65) **Prior Publication Data**

US 2011/0259919 A1 Oct. 27, 2011

Related U.S. Application Data

(62) Division of application No. 11/818,451, filed on Jun. 14, 2007.

(60) Provisional application No. 60/813,788, filed on Jun. 15, 2006.

(51) **Int. Cl.**
B67D 7/70 (2010.01)

(52) **U.S. Cl.** **222/135**; 222/145.5

(58) **Field of Classification Search** 222/94, 222/105–107, 135–137, 129, 129.1, 100, 222/131, 132, 145.1–145.8, 185.1, 181.1–181.3, 222/182–184; 229/117.09–117.17, 117.27–117.35
See application file for complete search history.

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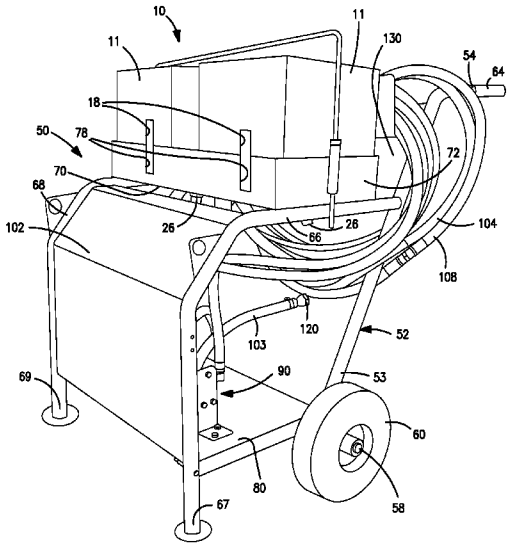
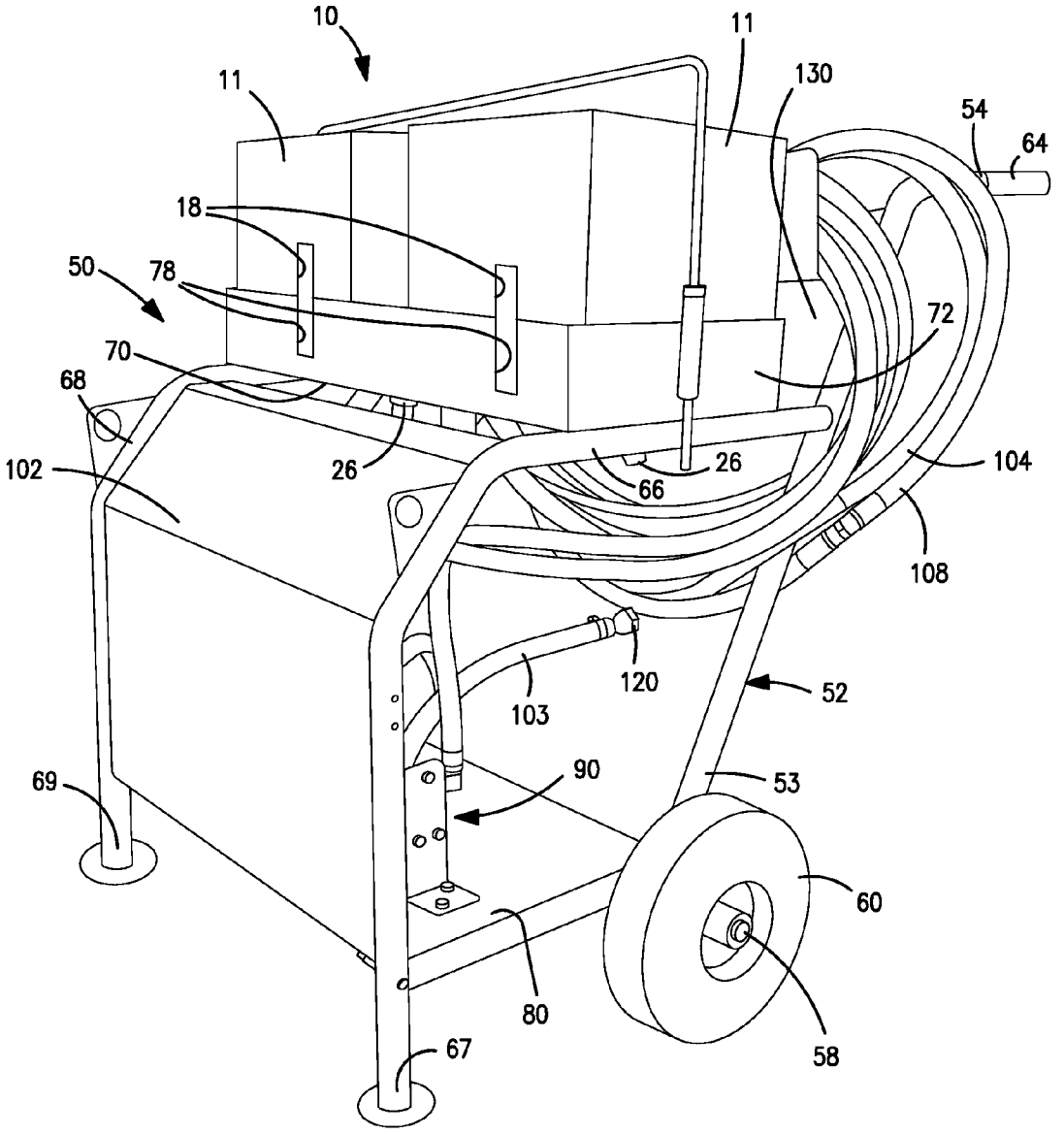
Primary Examiner — Lien Ngo
(74) *Attorney, Agent, or Firm* — Alix, Yale & Ristas, LLP

(57) **ABSTRACT**

A dispenser system employs a packaging module for use with moisture sensitive materials. The packaging module comprises an outer carton and an inner bladder, which is substantially impermeable to moisture and is filled with one part of an adhesive. The carton is loaded on a mobile cart and the one part adhesive is supplied to a pump/mixer without exposure to moisture in the atmosphere. The packaging and dispensing system can be used in conjunction with mechanized adhesive application equipment for the construction trades.

10 Claims, 8 Drawing Sheets

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58

FIG. 1

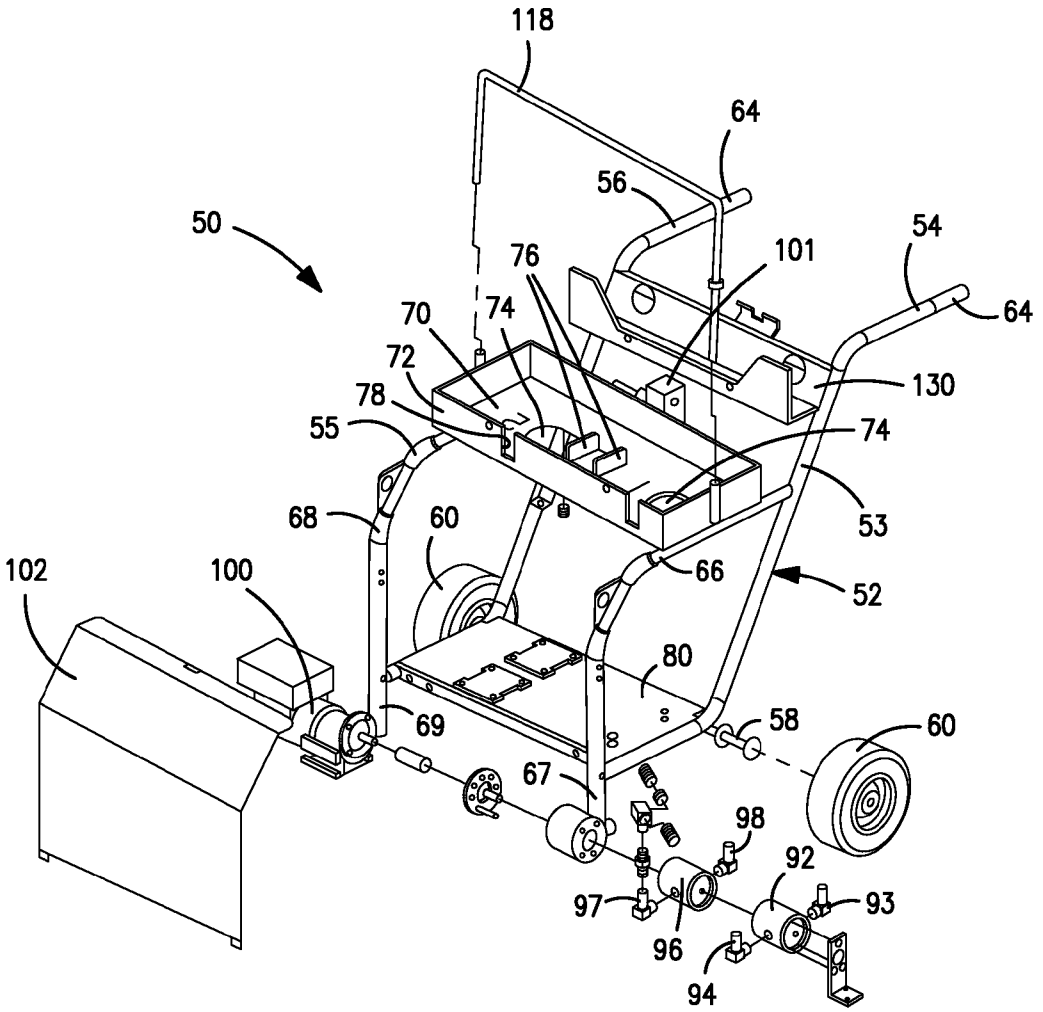
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FIG. 2

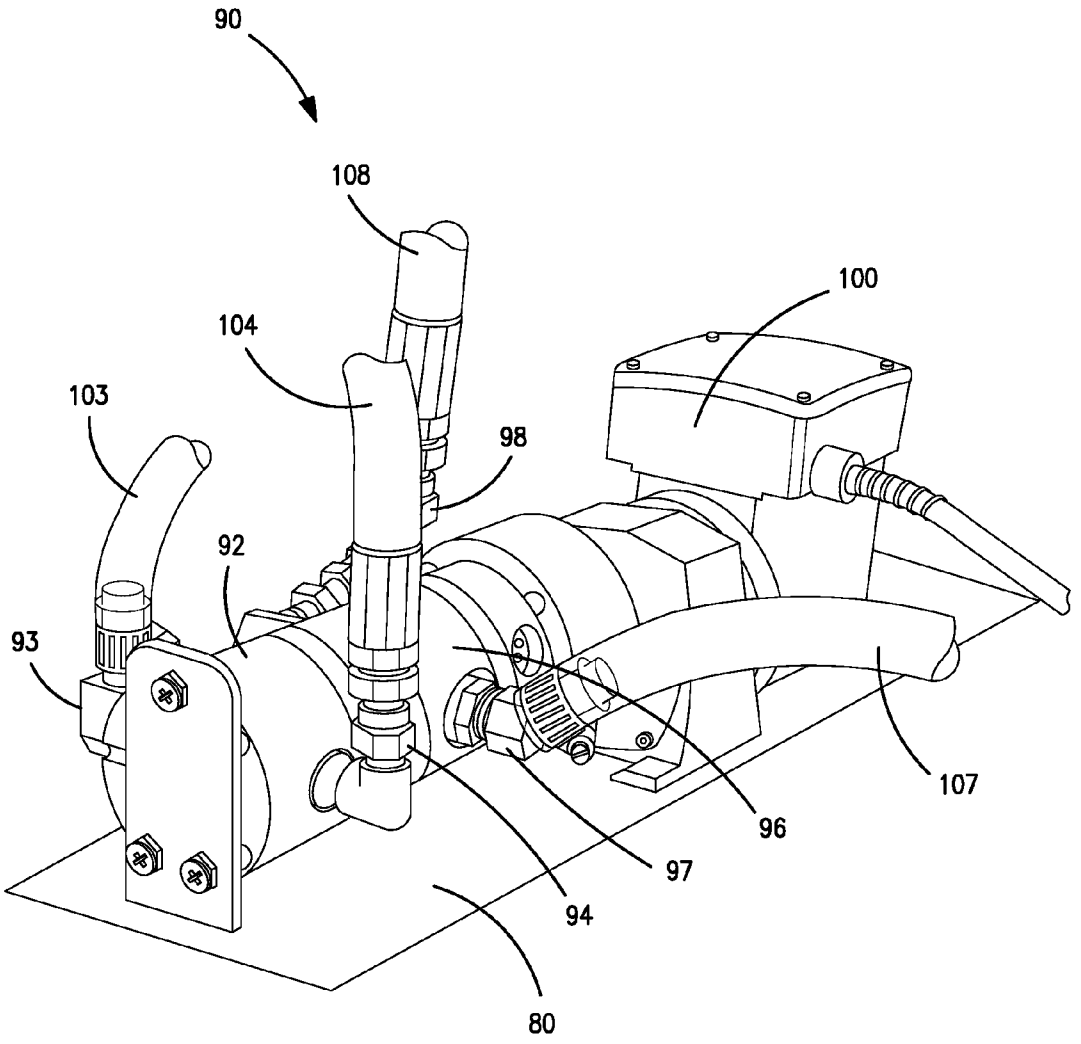


FIG. 3

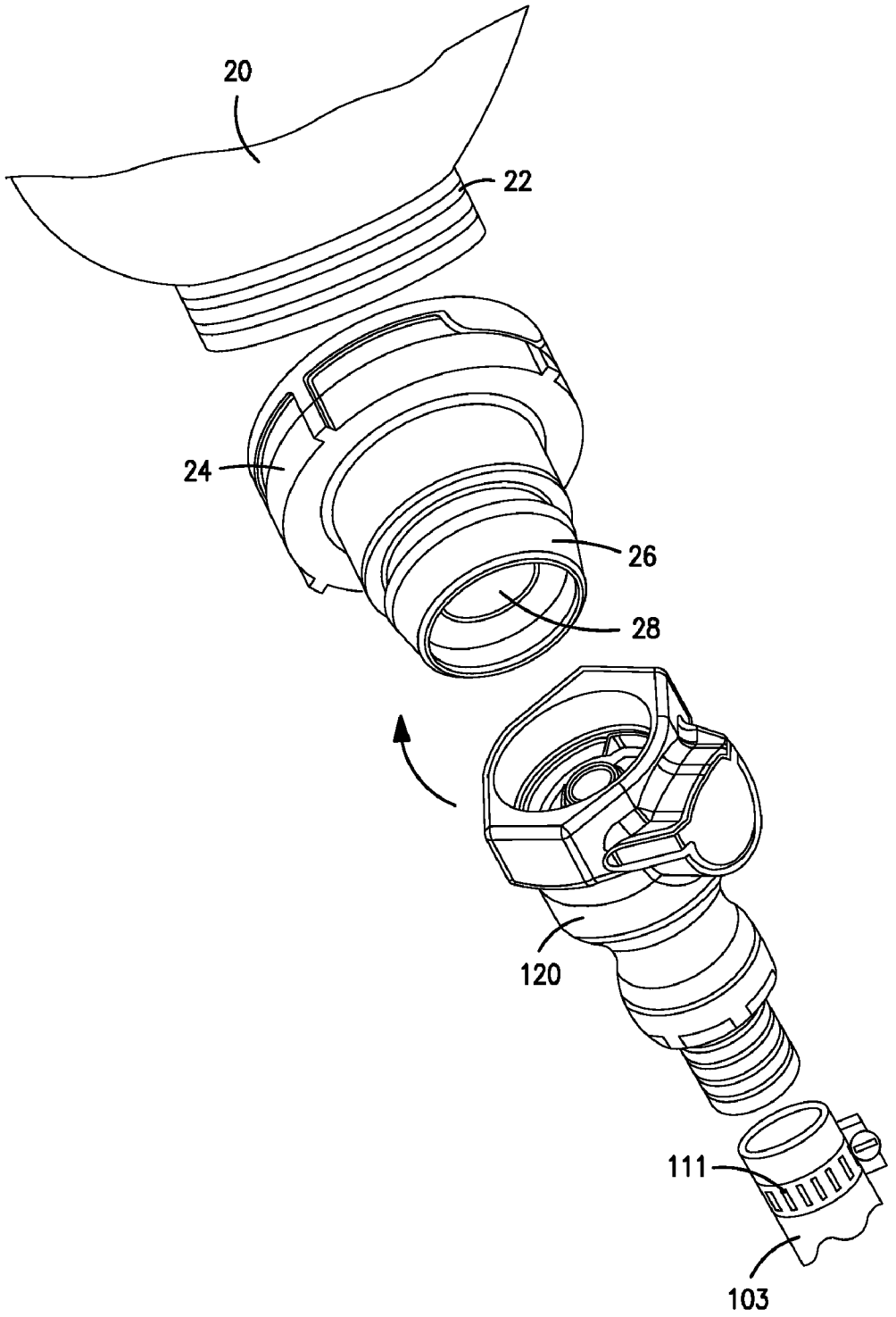
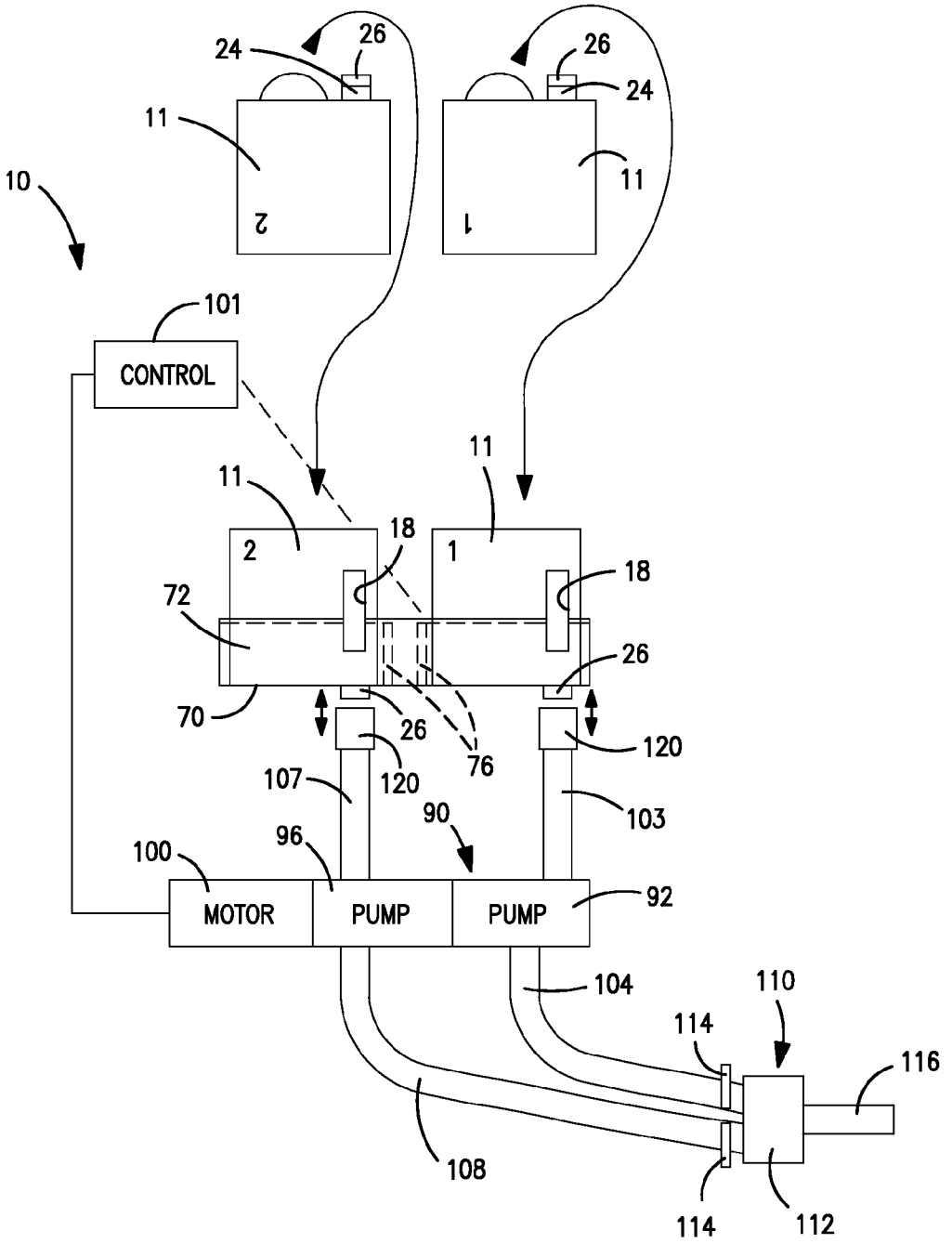


FIG. 4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108
112

FIG. 5

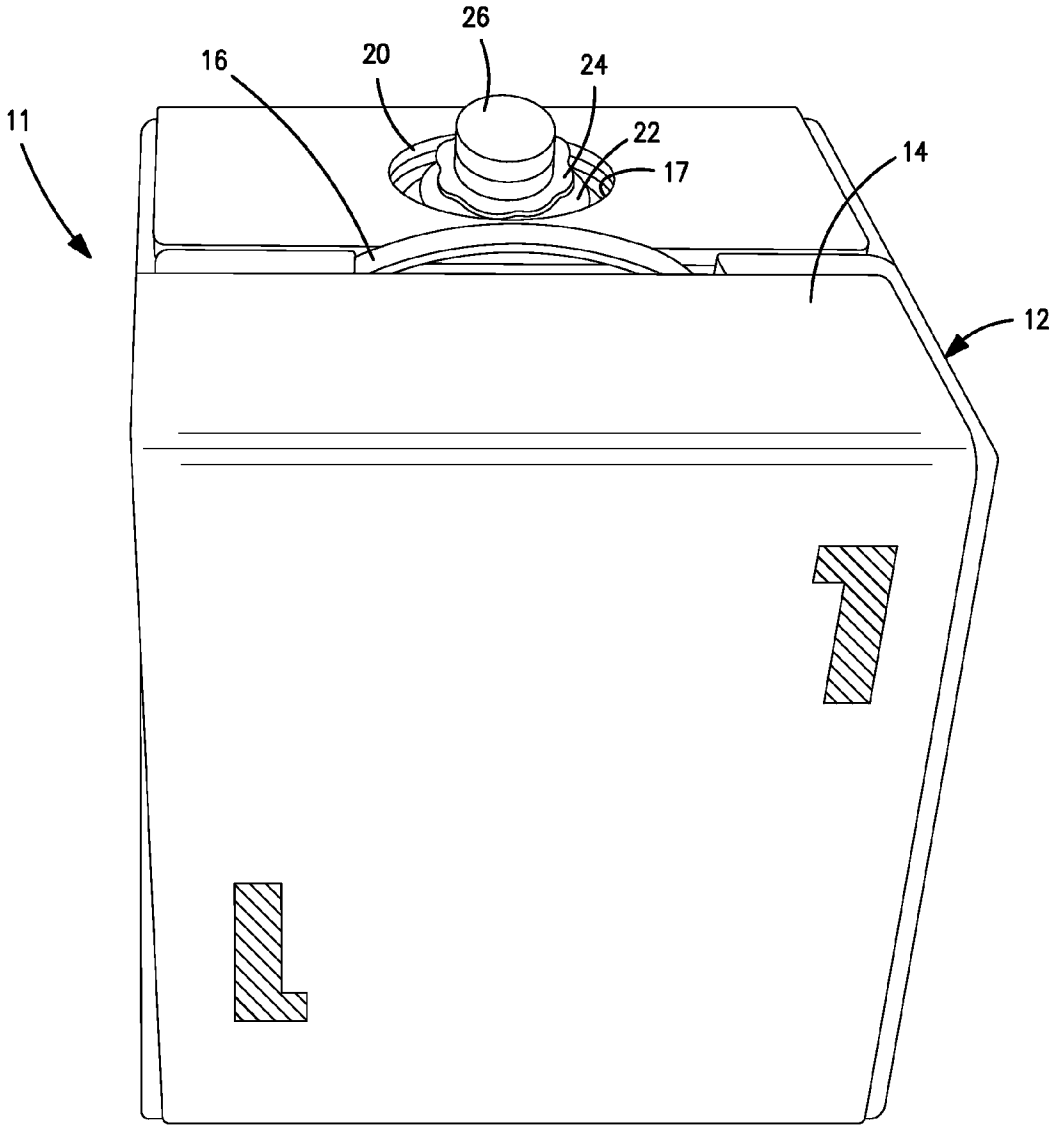

FIG. 6

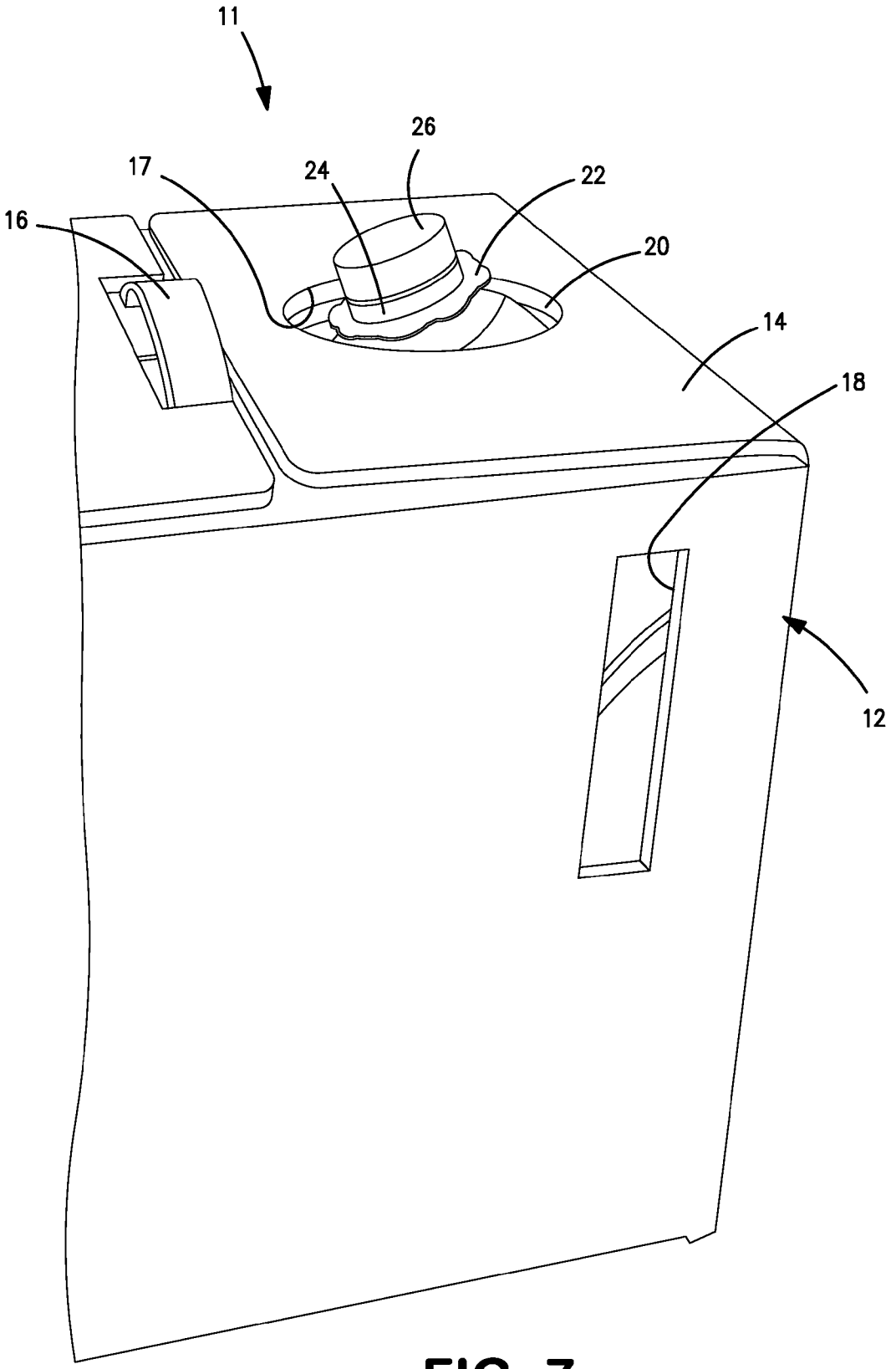

FIG. 7

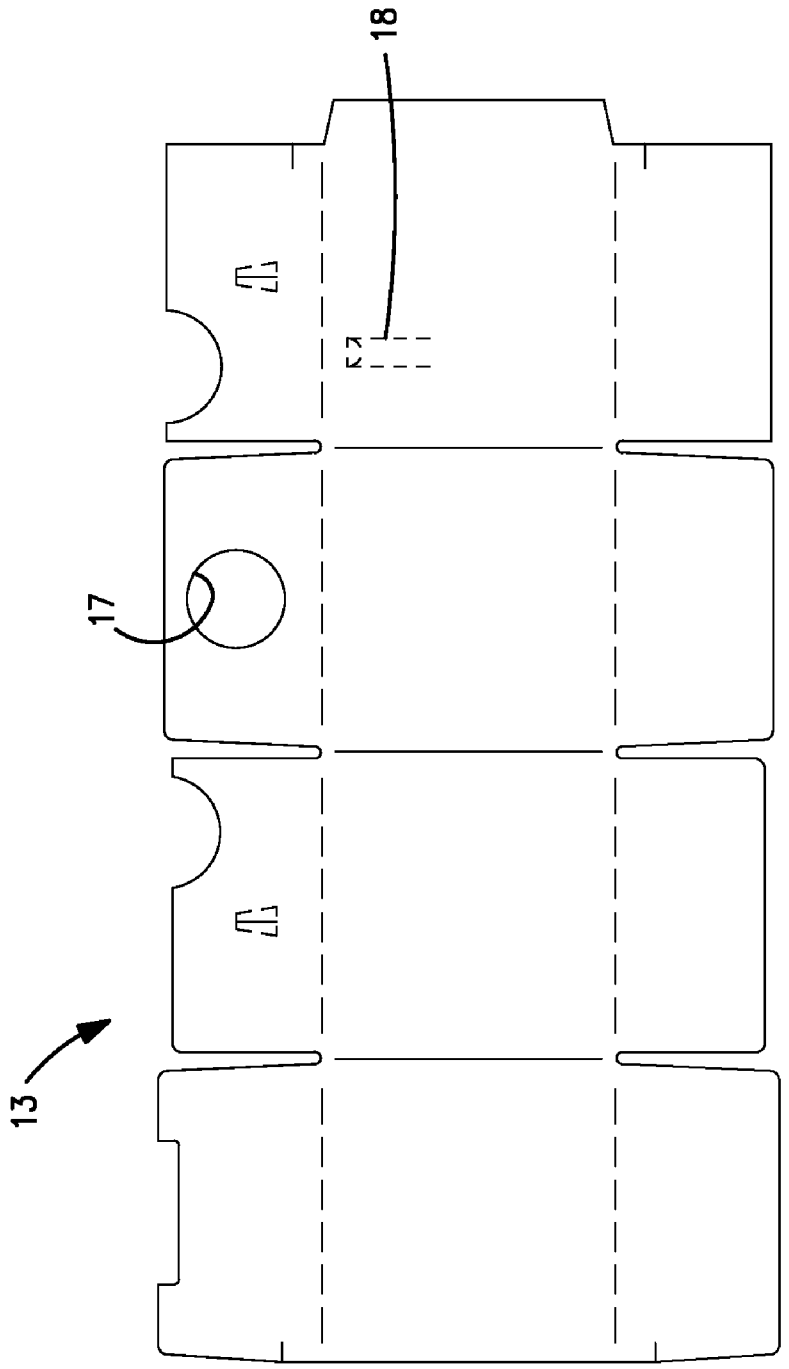

FIG. 8

ADHESIVE DISPENSER SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

This application is a divisional of U.S. application Ser. No. 11/818,451 filed on Jun. 14, 2007, which claims the priority of U.S. Provisional Application 60/813,788 filed on Jun. 15, 2006, the disclosure of which is incorporated by reference.

FIELD OF THE TECHNOLOGY

This application is directed to a packaging system for moisture-sensitive materials, and more particularly, to a dispensing system for moisture-sensitive adhesive materials used in the construction industry.

BACKGROUND OF THE INVENTION

In the construction industry, most moisture-sensitive materials, such as adhesive components, are packaged in a variety of sealable containers to prevent the contents from absorbing water from the atmosphere or moisture that collects on the surfaces of dispensing systems. Moisture commonly migrates into the fittings, nozzles and conduits of such dispensing systems. The dispensing system becomes clogged and the dispensing qualities are degraded to the extent that the system must be disassembled and cleaned. Significant costs and inefficiencies result from having to remove moisture which collects in the components of the dispensing system.

If the moisture-sensitive material is to remain viable over time, the user has to make sure that the packaging is tightly closed during periods of non-use. However, moisture-sensitive materials are inherently difficult to store after opening the original packaging, so in many cases, the unused portion is discarded after a construction job is completed. If moisture-sensitive materials are not discarded after opening the primary container, the material begins to chemically degrade, which can negatively affect the performance and physical properties of the remaining material. Additionally, the necessity of routinely discarding the unused portions of moisture-sensitive materials is costly, inconvenient, and environmentally unsound.

SUMMARY

An adhesive dispenser system for moisture-sensitive materials, such as construction adhesives, is provided. The adhesive dispenser system employs a packaging module which protects the contents therein from moisture in the atmosphere during use as well as during pre- and post-use storage and shipping. In one preferred embodiment, a packaging module comprises an outer container body or carton and an inner bag or bladder made of a water-impermeable flexible sheet material. The bladder has a truncated spout which is closed by a cap which is preferably valved. The bladder is filled with one part of an adhesive. The outer container body is preferably equipped with a handle, an opening to provide access to the spout and a window to allow inspection of the contents remaining in the bladder. The packaging module is adapted for efficient use with mechanical or motorized applicator systems.

The inner bladder receives and contains the moisture-sensitive material during shipping, use, and storage. It is also preferred that the spout has sidewalls extending upwardly to form a ridged neck portion and that the cap be threaded to the spout. Preferably, the spout and cap are manufactured from a durable plastic material. The spout can be closed or sealed either by use of a valved cap or similar sealing means. The spout via the cap is re-sealable after a first use such that the material therein remains in substantially the same condition as it was upon the first opening or first use of the material.

Briefly stated, one embodiment of a dispensing apparatus for a two-part adhesive comprises a cart having a tray. The carts mount a pump assembly which has a pair of inlets and a pair of outlets which communicate with a mixer/applicator gun. A first package encloses a bladder with an opening and which contains a first adhesive component. A second package encloses a bladder with a second opening and which contains a second adhesive component. The packages are each received on the tray. A conduit communicates via a first valve connector assembly between the opening of the package assembly and an inlet to the pump. A second conduit communicates via a second valve connector assembly between an opening of the second package and a second inlet to the pump. The first and second adhesive components are pumped by the pump assembly to a mixer/gun assembly and dispensed therefrom.

At least one package has a corrugated configuration. The package has a general rectangular shape with a handle mounted at one side. The package also has a window to permit inspection of the adhesive component contained in the corresponding bladder. The tray has a retention flange which surrounds the packages with the first and second packages being generally aligned in adjacent side disposition on the tray. At least one of the connector assemblies upon connection to the conduit does not permit exposure of the component in the bladder to the atmosphere. The connector assembly comprises a poppet valve and a snap-fit type connection. The snap-fit type engagement closes off the corresponding opening upon disconnecting the associated conduit from the opening. A hose connects the outlet to a mixer. The cart may further have a pair of wheels and handlebars for facilitating movement across a surface.

A method of dispensing a moisture sensitive adhesive with a mobile applicator system comprises providing a package having an outer container and an inner flexible enclosure that is substantially impermeable to moisture. The enclosure has an opening and is closed by a cap. The enclosure contains one part of an adhesive. The package is inverted. The package is then loaded onto a tray of the mobile applicator system. A conduit is connected for communication through the opening without exposing the one part to the atmosphere. The one part is mixed with the second part to form an adhesive and the adhesive is dispensed under pressure for application.

The conduit connecting step may employ lifting a valve to permit communication of one part into the conduit and implementing a snap fit connection between fittings of the cap and the conduit. The conduit may be disconnected from communication with the opening without exposing the one part in the inner enclosure to the atmosphere.

A packaging module comprises a carton having a box-like shape with one side having an opening. A water impermeable enclosure is disposed in the carton and has a spout alignable with or disposed in the opening and enclosed by a cap with a valve. A moisture sensitive part of the adhesive is disposed in the enclosure. A second side of the carton has a cutout portion defining a window. A handle extends from the first side. The carton preferably has a corrugated construction.

A better understanding will be obtained from the following detailed description of the presently preferred, albeit illustrative, embodiments of the adhesive dispenser invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of an adhesive dispenser system with portions of the system being removed;

FIG. **2** is an exploded view of a portion of the adhesive dispenser system of FIG. **1**;

FIG. **3** is an enlarged fragmentary perspective view of a portion of the adhesive dispenser system of FIG. **1**, viewed generally from the rear;

FIG. **4** is an enlarged fragmentary perspective view, partly exploded and partly in schematic, illustrating a portion of the adhesive dispenser system of FIG. **1**;

FIG. **5** is a schematic view illustrating the operation of an adhesive delivery system;

FIG. **6** is a frontal perspective view of a packaging module which may be employed in the adhesive dispenser;

FIG. **7** is a fragmentary perspective view of the packaging module of FIG. **6** from a second side thereof; and

FIG. **8** is a plan view of a pre-assembled form for an outer portion of the packaging module of FIG. **6**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An adhesive dispenser system is adapted for use with for moisture sensitive materials, such as two-part polyurethane adhesives used in the construction trades. For example, one commonly used chemical component for adhesive for which the system has particular applicability is methylene diphenyl diisocyanate (MDI)-which is moisture sensitive. The adhesive dispenser system, designated generally as **10**, employs at least one packaging module **11** which protects the pre-mixed components from moisture in the atmosphere, prevents the escape of volatile materials and ultimately substantially prevents, if not eliminates, crystallization in the pump, mixing components, conduits, delivery hoses and fixtures. The adhesive dispenser system **10** is used to facilitate the mixing and dispensing of moisture sensitive materials, as well as to ensure material integrity during shipping, pre-use storage and post-use storage.

With reference to FIGS. **6-8**, in one preferred embodiment, a packaging module unit **11** comprises an outer container body or carton **12** and an inner bag member or bladder **20** (only partially illustrated). The inner bladder **20** is made of a water-impermeable flexible sheet material and has a spout **22** which is closed by a threaded cap **24**. As described below, the cap **24** is valved and adapted for efficient connection with a conduit. The spout **20** may be truncated and have a reinforced ridged neck portion. The bladder is filled with one part of the adhesive (not illustrated) and, upon filling, substantially occupies the interior volume of the carton **12** and preferably closely conforms to the interior sides of the carton. The carton **12** is preferably a corrugated rigid or semi-rigid, box-like structure manufactured from a die cut panel **13** such as illustrated in FIG. **8**. The carton supports and protects the bladder **20** and its contents and also facilitates transportation and handling.

For storage and transportation purposes, the carton **12** includes a top side **14** to which a handle **16** is affixed. The carton also has an opening **16** in side **14** to provide access to the spout **22** and cap **24** of the bladder. Another side of the carton includes an elongated window **18** which extends to a short distance from the top surface to allow inspection of the contents of the bladder and, in particular, the amount of remaining material.

The inner bladder **20** receives and contains the moisture-sensitive material during shipping, use and pre- and post-use storage. Preferably, the inner bladder **20** is manufactured from a durable plastic material which is translucent or transparent to allow the contents to be viewed. It is preferred that the inner bladder **20** has a raised reinforced spout **22** equipped for threading with interior threads of the cap **24**. The spout **22** has sidewalls extending upwardly to form a ridged structure to an opening for the bladder. The cap **24** is pre-installed shortly after the adhesive components are placed in the bladder **20**.

In another preferred embodiment, the spout **22** is self-sealing either by use of a twist-cap, valve, or similar closing or sealing means. According to this embodiment, the spout **22** is repeatedly sealable so that the material therein remains in substantially the same condition as it was upon the first opening or first use of the material inside the bladder **20**.

In another embodiment, the carton **12** has an inside surface (not illustrated) that is covered or coated with a substantially water impermeable membrane so that the inside surface forms a substantially continuous liner member. According to this embodiment, the spout is sealed with the liner member so that any material contained within is substantially protected from moisture. Alternatively, the spout and the membrane defining the liner are manufactured as a one-piece unit.

With reference to FIGS. **1** and **2**, the packaging module **11** is especially adapted for incorporation and use in conjunction with a mobile dispenser cart **50**. The cart **50** includes a tubular support frame **52** which mounts the various dispenser components and component materials and provides mobility and efficient organization for the dispenser system. The frame **52** includes a pair of laterally spaced, angler tubular supports **53** and **55** which upwardly terminate in handlebars **54** and **56** and, at a lower rear location, receive an axle **58** for a pair of wheels **60**. The handlebars angle rearwardly at an upper rear location and include a pair of grips **64** to facilitate manual movement of the cart. A pair of laterally spaced angled tubular supports **66** and **68** extend forwardly from a medial location of the handlebars and extend downwardly to terminate at a pair of support legs **67** and **69**. The legs provide a stable support for the cart and allow the cart to be pivotally tilted for movement of the cart in hand-truck fashion whereby the wheels **60** support the cart and facilitate rolling movement.

A lateral, generally horizontal tray **70** is mounted to the support arms. The tray has a circumferential upstanding retaining flange **72**. The tray has openings **74** (FIG. **2**) as well as a pair of spaced centrally located upright position guides **76**. A pair of forward laterally spaced slots **78** are also formed in the retention flange **72**.

With additional reference to FIG. **3**, a shelf **80** extends between the supports **53** and **55** at a lower forward position adjacent the joining with supports **66** and **68** to form a generally horizontally disposed support platform. A dual inline geroter pump assembly **90** is mounted to the lower support platform. A pump unit **92** has an inlet **93** and an outlet **94**. Pump unit **96** (mounted in reverse relationship to pump unit **92**) has an inlet **97** and an outlet **98**. Inlets **93** and **97** communicate and connect via connectors with respective transparent conduits **103** and **107** which communicate with the packaging units **11** so that each part of the adhesive is generally supplied under gravity to the respective pump unit. Outlet fittings **94** and **98** connect with the dispensing/delivery hoses **104** and **108**. The pump units are driven by an electric motor **100** which is controlled by a control module **101** mounted to the rear of the tray. A skirt **102** may be mounted to the front of supports **66** and **68** to generally enclose and protect the various conduits and the pump assembly **90**.

With additional reference to FIG. **5**, the tray **70** is dimensioned and configured for receiving respective cartons **11** for the first and second parts of the adhesive. With additional reference to FIG. **4**, the cartons are configured for usage and connection by the cap **24** which has a projecting male fitting **26** and an intermediate poppet valve **28**. The carton is then

inverted so that the top side **14** rests on the tray. The carton is positioned so that the projecting male fitting **26** is received in the tray opening **74** or alignable therewith. The window **18** of the carton preferably essentially aligns with a slot **78** of the tray. An upstanding guide **76** engages one side of the carton to facilitate proper positioning. The same process is repeated for the carton **11** of the other part (for a two part adhesive).

An inverted U-shaped retention bar **118** is then mounted over the top of the tray and each module **11** to secure them in position. For applications where only one part is moisture sensitive, only one packaging module **11** may be employed.

Conduits **103** and **107** respectively extend from each inlet **93** and **97** and at an opposite end mount via a hose clamp **111** a female fitting **120**. Fitting **120** couples with the cap fitting **26** to provide an efficient snap fit connection and open the poppet valve **28** for providing a flow connection from the container bladder to the conduit without exposure to the atmosphere. The fittings which provide for the connection may be similar to that disclosed in U.S. Pat. No. 5,911,403, the disclosure which is incorporated herein by reference.

Hoses **104** and **108** connect with a mixing nozzle **110**. In one embodiment the hoses **104** and **108** are each approximately 30 feet in length. Each of the cartons may thus be connected to the pump assembly and ultimately the dispensing hoses **104** and **108** and the mixing gun assembly **110** without exposure to the atmosphere (and disconnected from the packaging module contents). The dispensing hoses **104** and **108** extend from the pump outlets **94** and **98** to provide a delivery conduit for delivery of the adhesive parts to the mixer **112**. The hoses each preferably have lever operated valve **114** at the input openings to the mixer **112**. Upon mixture of the constituent two parts, the adhesive is forced under pressure through a dispensing fixture or nozzle, such as representative wand **116** which includes a helical output path.

A bracket **130** may traverse at an upper location between the supports **53** and **55** to provide a retaining support for coiling the hoses **104** and **108** and/or power cords. The control module **101** including a switch is mounted at the rear of the tray to provide an accessible control unit for operating the pump assembly **90**.

It should be appreciated that in the event it is necessary to replace one of the components for the adhesive, replacement is relatively efficiently accomplished by disengaging the snap fit connectors **26**, **120** which, due to the poppet valve nature, does not expose the adhesive components to the atmosphere, and replacing the carton **11** with another suitable carton **11** as previously described. The pump assembly may be powered, in some instances by a gas engine (not illustrated).

What is claimed:

1. A dispensing apparatus for a two-part adhesive comprising:

a cart having a generally planar tray with a first aperture and a second aperture and mounting a pump assembly having a pair of inlets and a pair of outlets communicating with a mixer;

a first package having a generally planar first side and enclosing a first bladder with a first spout and a first opening and containing a first adhesive component, said first spout projecting through said first side;

a second package having a generally planar second surface enclosing a second bladder with a second spout and a second opening and containing a second adhesive component, said second spout projecting through said second side;

said first and second packages each being received on said tray wherein said first and second sides engage said tray and said first spout is received in said first aperture and said second spout is received in said second aperture;

a first conduit disposed below said tray and communicating via a first valved connector assembly between the first opening and one said inlet; and

a second conduit disposed below said tray and communicating via a second valved connector assembly between the second opening and a second said inlet, wherein said first and second adhesive components are pumped by said pump assembly to said mixer and dispensed therefrom.

2. The dispensing apparatus of claim **1** wherein at least one said package has a rectilinear corrugated configuration.

3. The dispensing apparatus in claim **1** wherein at least one said package has a generally rectangular shape with a handle being mounted at one side.

4. The dispensing apparatus in claim **1** wherein at least one said package has a window to permit inspection of the adhesive component contained in said corresponding bladder.

5. The dispensing apparatus in claim **1** wherein said tray includes a retention flange surrounding said packages and said first package and said second package are mounted in generally aligned adjacent side disposition on said tray.

6. The dispensing apparatus of claim **1** wherein at least one connector assembly does not permit exposure of the component in the bladder to the atmosphere upon connection of the conduit.

7. The dispensing apparatus of claim **6** wherein said connector assembly comprises a poppet valve and a snap fit type connection.

8. The dispensing apparatus of claim **1** wherein at least one conduit has a snap-fit type engagement connector assembly which closes off the corresponding opening upon disconnecting said associated conduit from an associated opening.

9. The dispensing apparatus of claim **1** further comprising a hose connecting each said outlet and said mixer and said mixer comprises a mixing nozzle.

10. The dispensing apparatus of claim **1** wherein said cart further comprises a pair of wheels and a pair of handlebars for facilitating movement across a surface.

* * * * *

EXHIBIT D

US008167170B2

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

(10) **Patent No.: US 8,167,170 B2**
(45) **Date of Patent: May 1, 2012**

(54) **ADHESIVE DISPENSER SYSTEM**

(75) Inventors: **Stanley W. Choiniere**, Southwick, MA (US); **Joshua S. Kelly**, Longmeadow, MA (US)

(73) Assignee: **Handy & Harman**, Rye, NY (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 486 days.

(21) Appl. No.: **11/818,451**

(22) Filed: **Jun. 14, 2007**

(65) **Prior Publication Data**

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Related U.S. Application Data

(60) Provisional application No. 60/813,788, filed on Jun. 15, 2006.

(51) **Int. Cl.**
B65D 35/22 (2006.01)

(52) **U.S. Cl.** **222/94**

(58) **Field of Classification Search** 222/94, 222/105–107, 129, 129.1, 145.1–145.8, 181–184, 222/185.1–185.3, 100, 131–137; 229/117.09–117.17, 117.27–117.35
See application file for complete search history.

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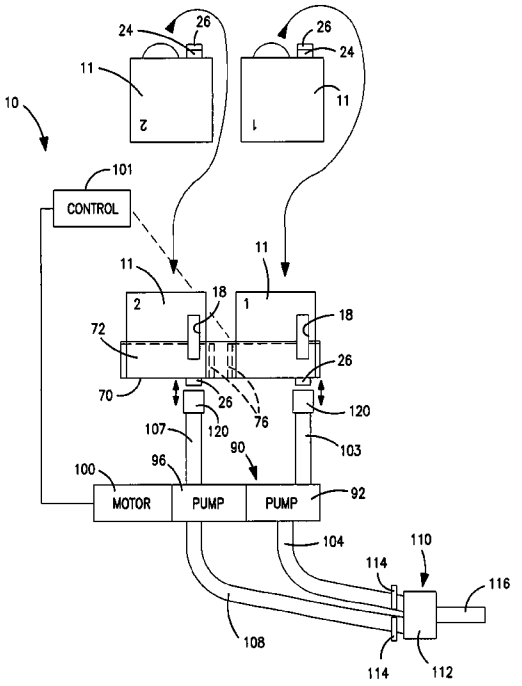
(74) *Attorney, Agent, or Firm* — Alix, Yale & Ristas, LLP

(57) **ABSTRACT**

A dispenser system employs a packaging module for use with moisture sensitive materials. The packaging module comprises an outer carton and an inner bladder, which is substantially impermeable to moisture and is filled with one part of an adhesive. The carton is loaded on a mobile cart and the one part adhesive is supplied to a pump/mixer without exposure to moisture in the atmosphere. The packaging and dispensing system can be used in conjunction with mechanized adhesive application equipment for the construction trades.

17 Claims, 8 Drawing Sheets



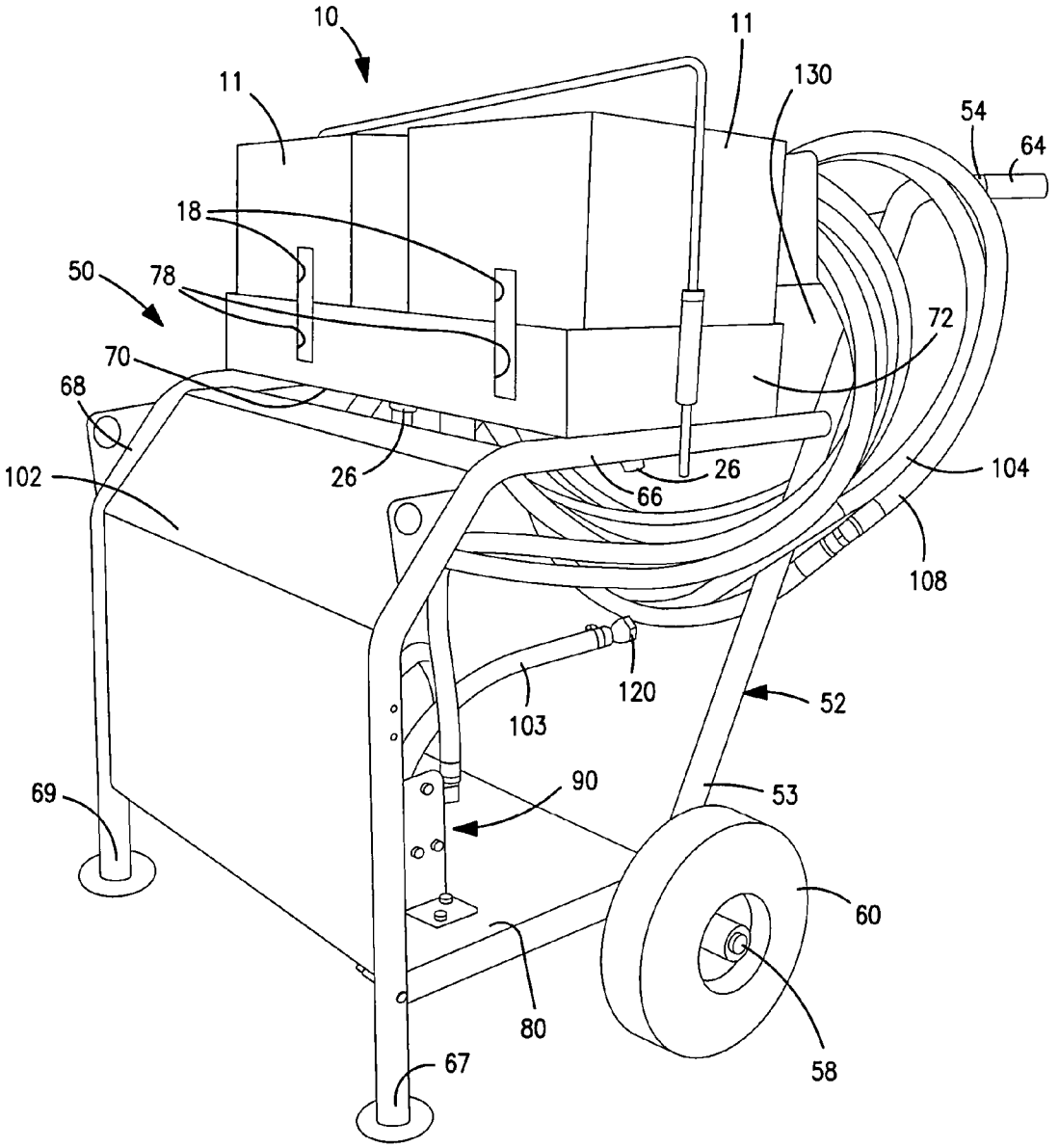

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FIG. 1

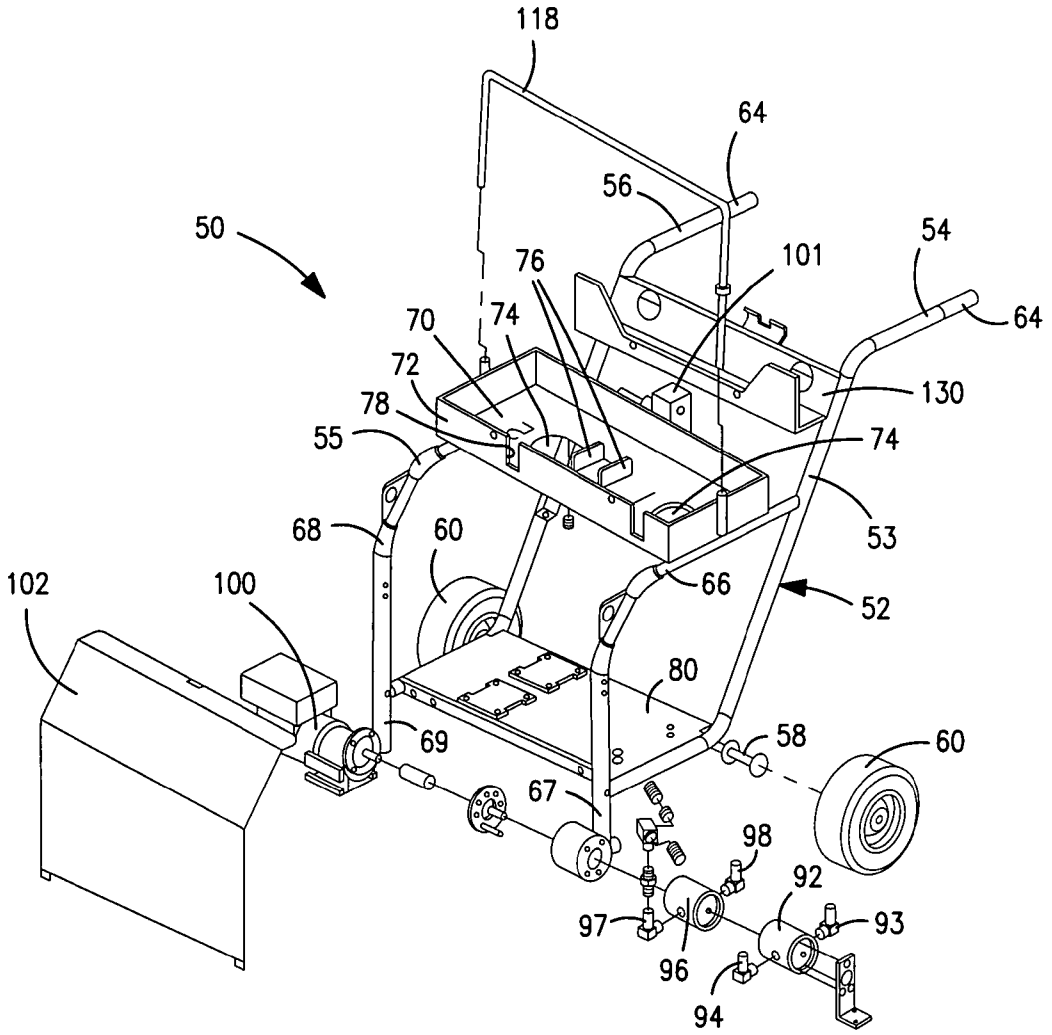
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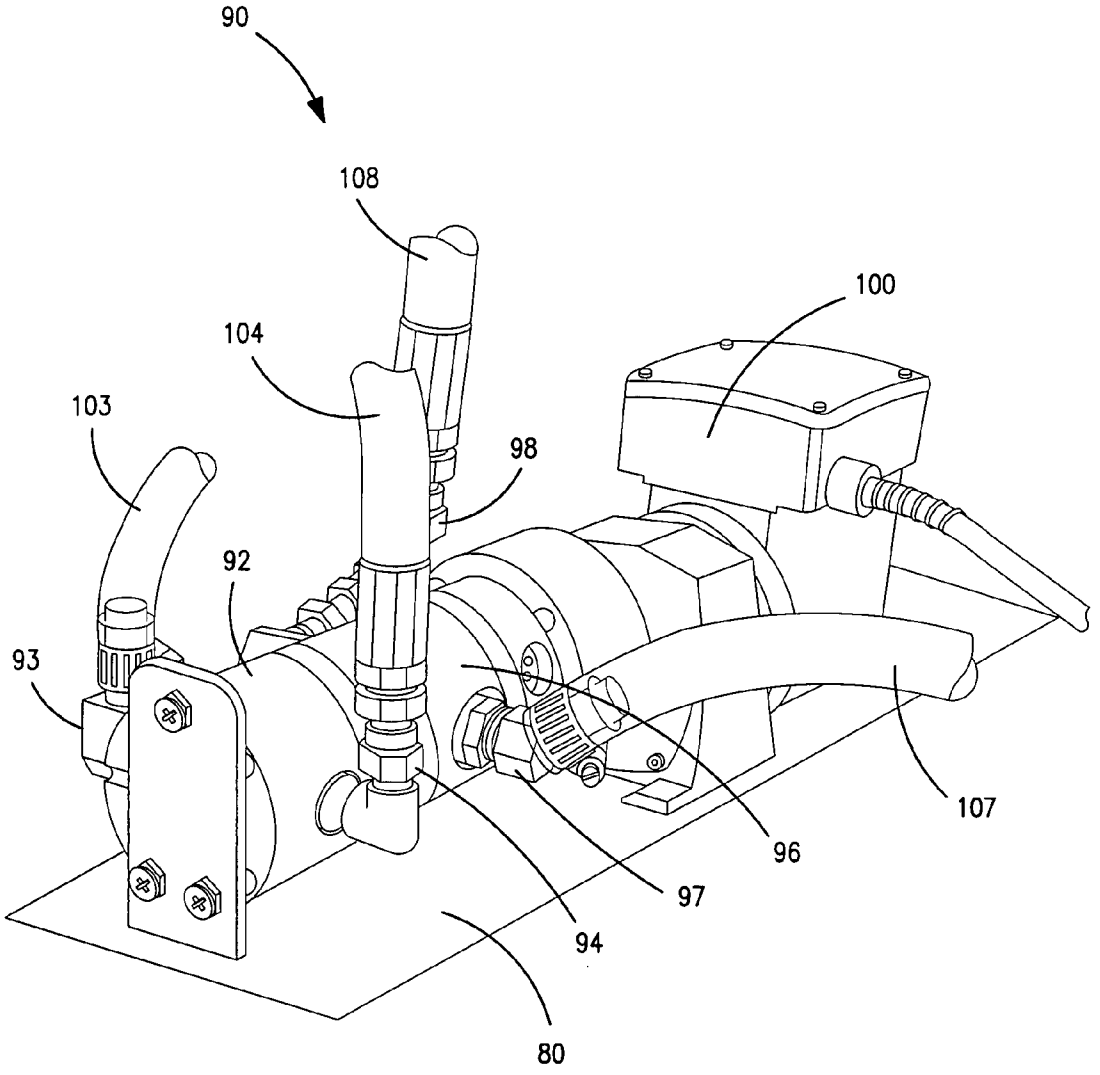
FIG. 2



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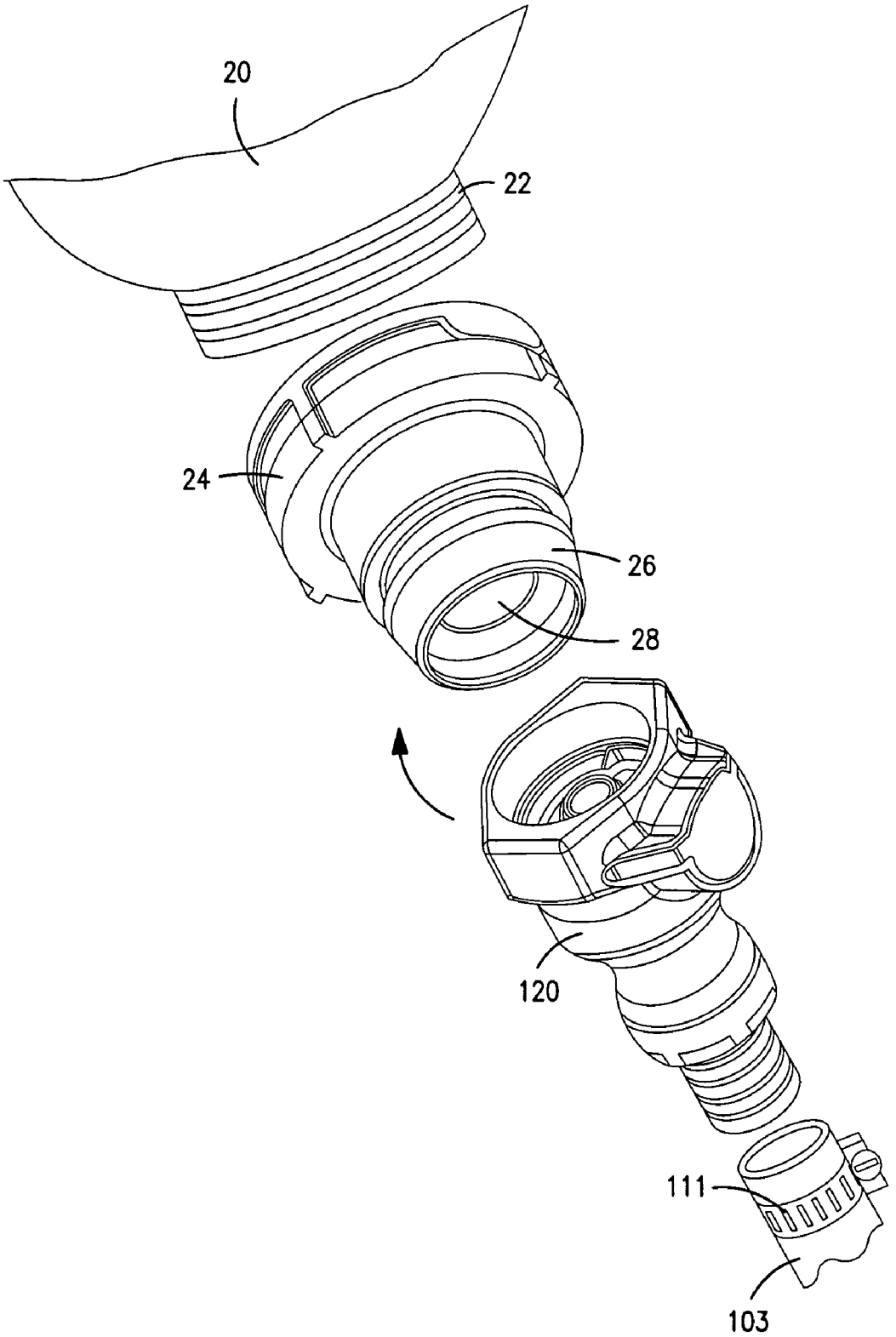

FIG. 4

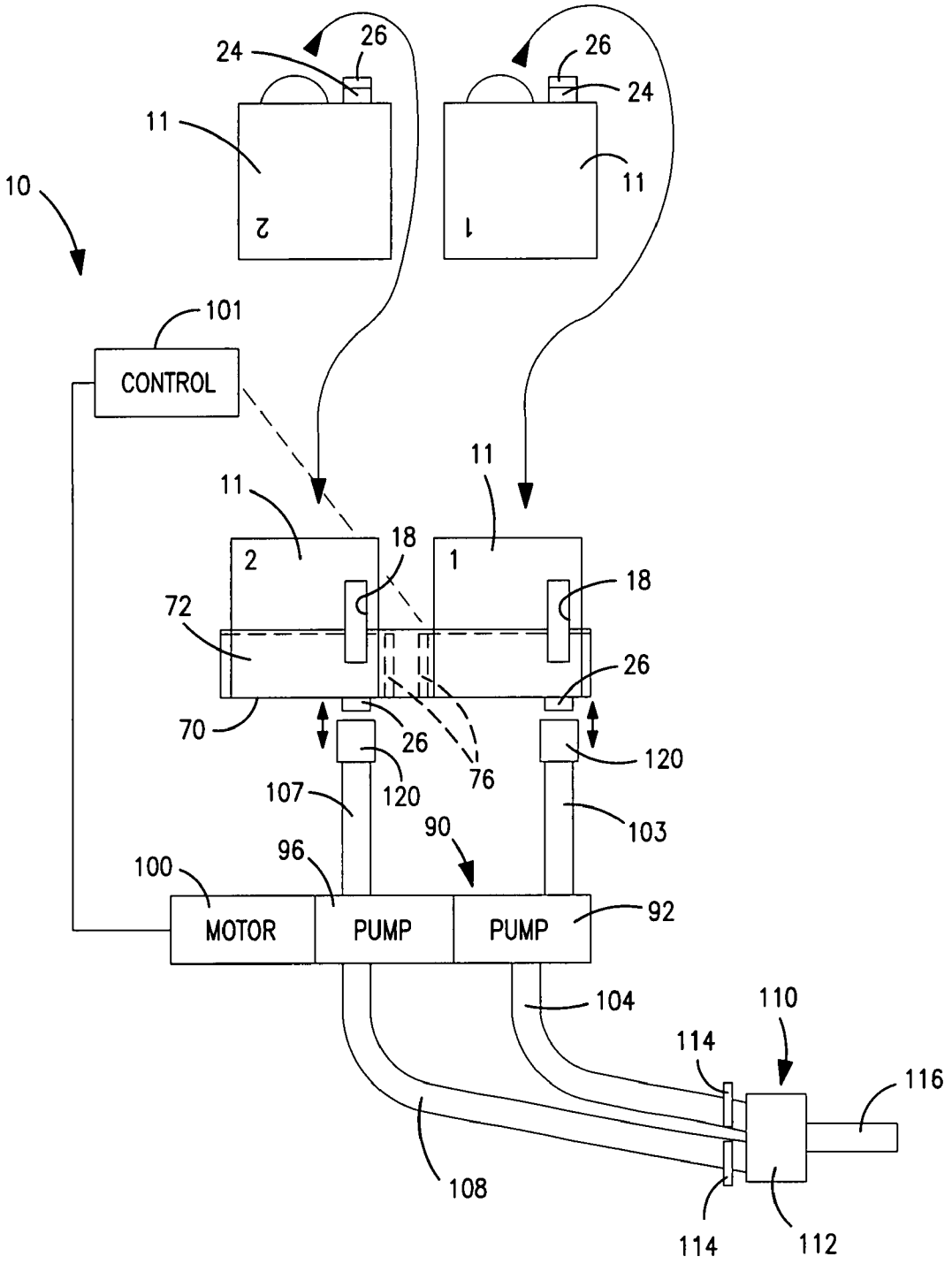
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FIG. 5

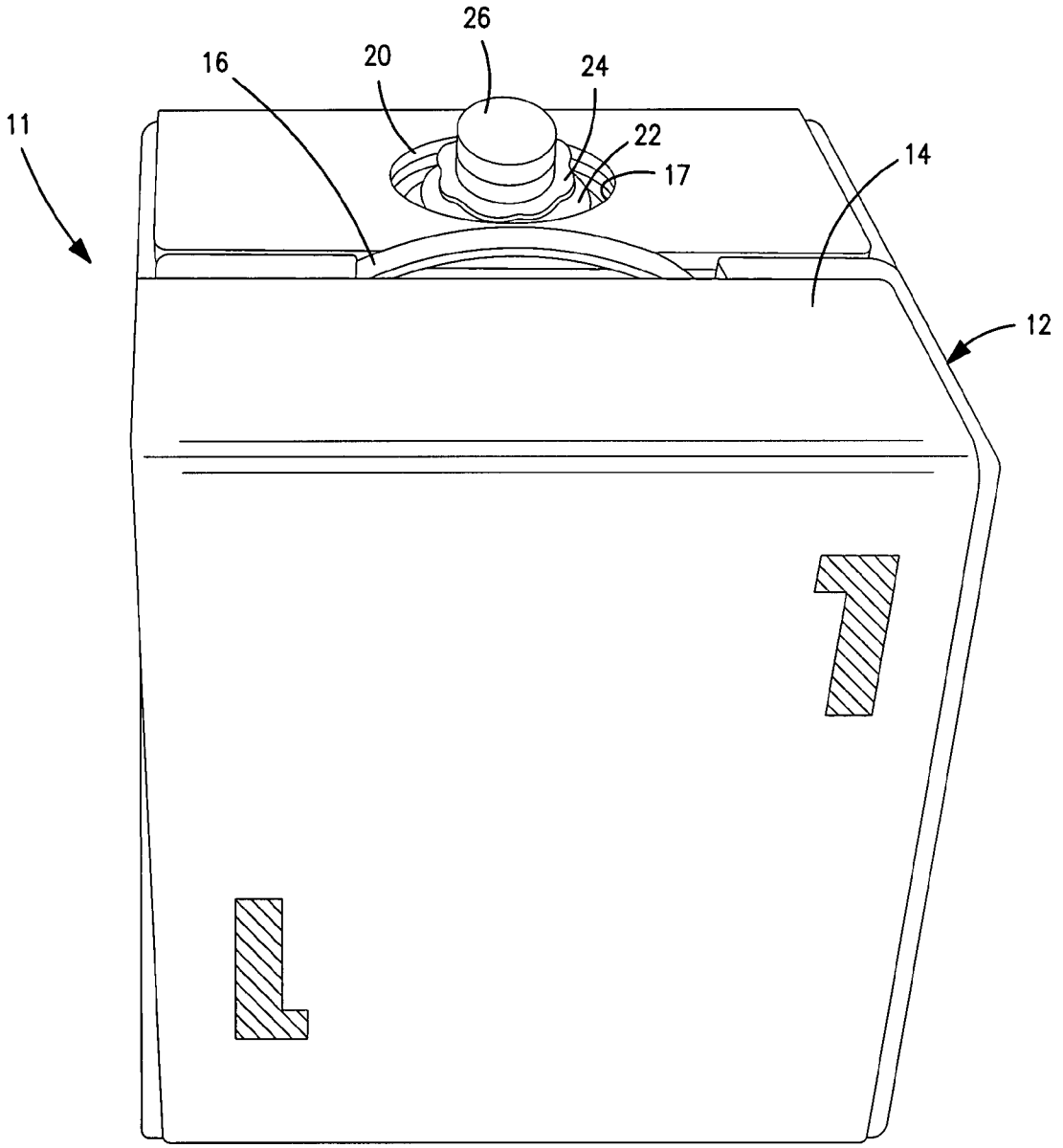

FIG. 6

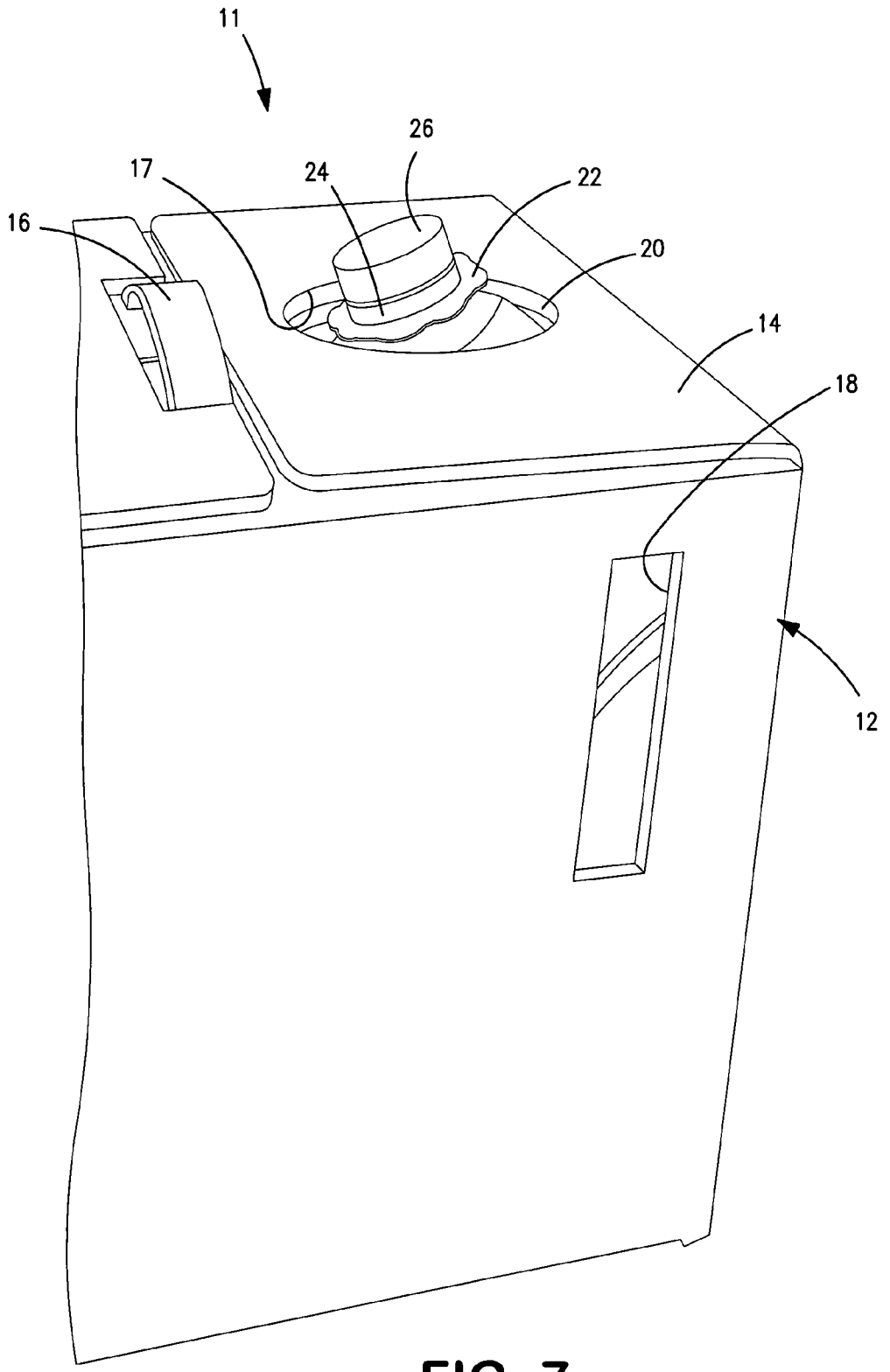

FIG. 7

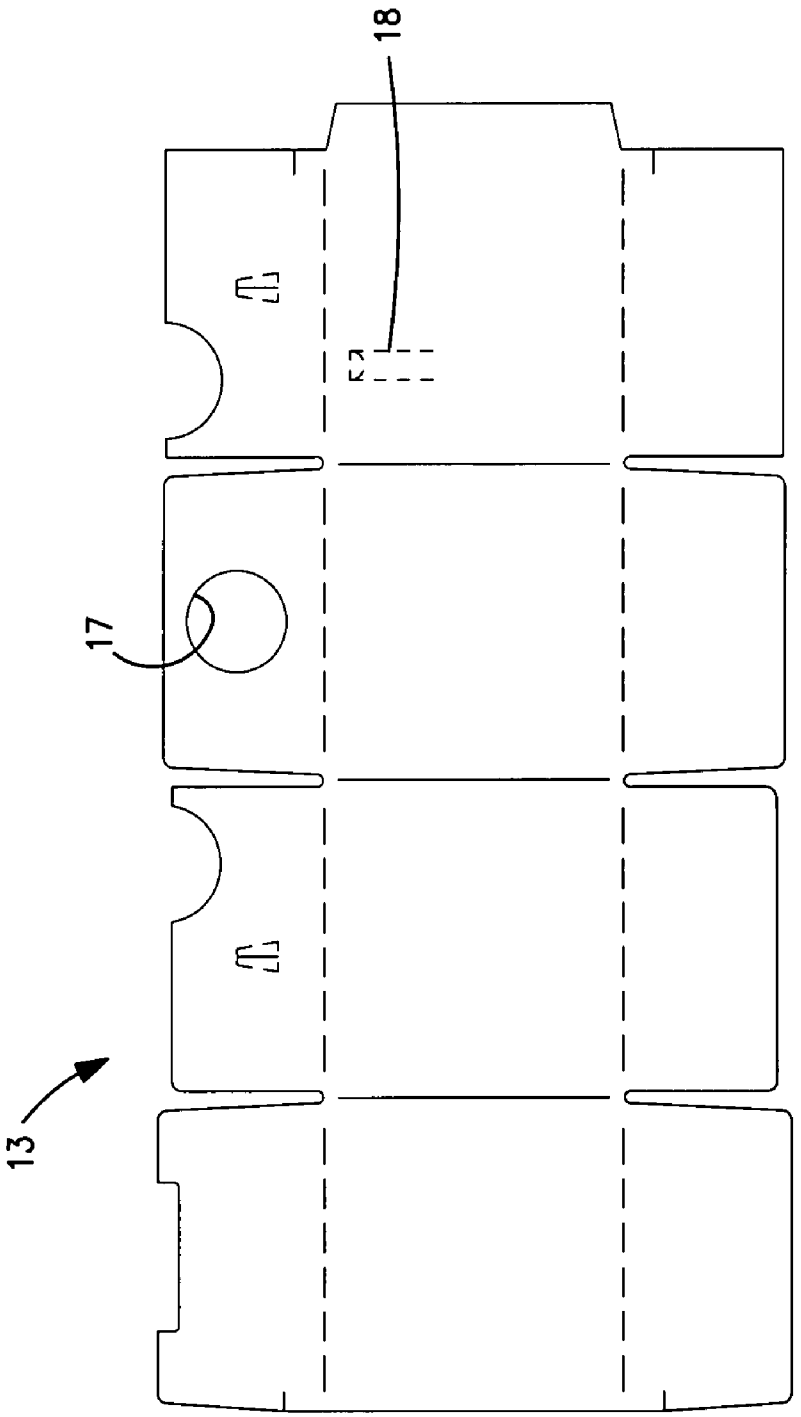

FIG. 8

ADHESIVE DISPENSER SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the priority of U.S. Provisional Application 60/813,788 filed on Jun. 15, 2006, the disclosure of which is incorporated by reference.

FIELD OF THE TECHNOLOGY

This application is directed to a packaging system for moisture-sensitive materials, and more particularly, to a dispensing system for moisture-sensitive adhesive materials used in the construction industry.

BACKGROUND OF THE INVENTION

In the construction industry, most moisture-sensitive materials, such as adhesive components, are packaged in a variety of sealable containers to prevent the contents from absorbing water from the atmosphere or moisture that collects on the surfaces of dispensing systems. Moisture commonly migrates into the fittings, nozzles and conduits of such dispensing systems. The dispensing system becomes clogged and the dispensing qualities are degraded to the extent that the system must be disassembled and cleaned. Significant costs and inefficiencies result from having to remove moisture which collects in the components of the dispensing system.

If the moisture-sensitive material is to remain viable over time, the user has to make sure that the packaging is tightly closed during periods of non-use. However, moisture-sensitive materials are inherently difficult to store after opening the original packaging, so in many cases, the unused portion is discarded after a construction job is completed. If moisture-sensitive materials are not discarded after opening the primary container, the material begins to chemically degrade, which can negatively affect the performance and physical properties of the remaining material. Additionally, the necessity of routinely discarding the unused portions of moisture-sensitive materials is costly, inconvenient, and environmentally unsound.

SUMMARY

An adhesive dispenser system for moisture-sensitive materials, such as construction adhesives, is provided. The adhesive dispenser system employs a packaging module which protects the contents therein from moisture in the atmosphere during use as well as during pre- and post-use storage and shipping. In one preferred embodiment, a packaging module comprises an outer container body or carton and an inner bag or bladder made of a water-impermeable flexible sheet material. The bladder has a truncated spout which is closed by a cap which is preferably valved. The bladder is filled with one part of an adhesive. The outer container body is preferably equipped with a handle, an opening to provide access to the spout and a window to allow inspection of the contents remaining in the bladder. The packaging module is adapted for efficient use with mechanical or motorized applicator systems.

The inner bladder receives and contains the moisture-sensitive material during shipping, use, and storage. It is also preferred that the spout has sidewalls extending upwardly to form a ridged neck portion and that the cap be threaded to the spout. Preferably, the spout and cap are manufactured from a durable plastic material. The spout can be closed or sealed either by use of a valved cap or similar sealing means. The spout via the cap is re-sealable after a first use such that the material therein remains in substantially the same condition as it was upon the first opening or first use of the material.

Briefly stated, one embodiment of a dispensing apparatus for a two-part adhesive comprises a cart having a tray. The carts mount a pump assembly which has a pair of inlets and a pair of outlets which communicate with a mixer/applicator gun. A first package encloses a bladder with an opening and which contains a first adhesive component. A second package encloses a bladder with a second opening and which contains a second adhesive component. The packages are each received on the tray. A conduit communicates via a first valve connector assembly between the opening of the package assembly and an inlet to the pump. A second conduit communicates via a second valve connector assembly between an opening of the second package and a second inlet to the pump. The first and second adhesive components are pumped by the pump assembly to a mixer/gun assembly and dispensed therefrom.

At least one package has a corrugated configuration. The package has a general rectangular shape with a handle mounted at one side. The package also has a window to permit inspection of the adhesive component contained in the corresponding bladder. The tray has a retention flange which surrounds the packages with the first and second packages being generally aligned in adjacent side disposition on the tray. At least one of the connector assemblies upon connection to the conduit does not permit exposure of the component in the bladder to the atmosphere. The connector assembly comprises a poppet valve and a snap-fit type connection. The snap-fit type engagement closes off the corresponding opening upon disconnecting the associated conduit from the opening. A hose connects the outlet to a mixer. The cart may further have a pair of wheels and handlebars for facilitating movement across a surface.

A method of dispensing a moisture sensitive adhesive with a mobile applicator system comprises providing a package having an outer container and an inner flexible enclosure that is substantially impermeable to moisture. The enclosure has an opening and is closed by a cap. The enclosure contains one part of an adhesive. The package is inverted. The package is then loaded onto a tray of the mobile applicator system. A conduit is connected for communication through the opening without exposing the one part to the atmosphere. The one part is mixed with the second part to form an adhesive and the adhesive is dispensed under pressure for application.

The conduit connecting step may employ lifting a valve to permit communication of one part into the conduit and implementing a snap fit connection between fittings of the cap and the conduit. The conduit may be disconnected from communication with the opening without exposing the one part in the inner enclosure to the atmosphere.

A packaging module comprises a carton having a box-like shape with one side having an opening. A water impermeable enclosure is disposed in the carton and has a spout alignable with or disposed in the opening and enclosed by a cap with a valve. A moisture sensitive part of the adhesive is disposed in the enclosure. A second side of the carton has a cutout portion defining a window. A handle extends from the first side. The carton preferably has a corrugated construction.

A better understanding will be obtained from the following detailed description of the presently preferred, albeit illustrative, embodiments of the adhesive dispenser invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of an adhesive dispenser system with portions of the system being removed;

FIG. **2** is an exploded view of a portion of the adhesive dispenser system of FIG. **1**;

FIG. **3** is an enlarged fragmentary perspective view of a portion of the adhesive dispenser system of FIG. **1**, viewed generally from the rear;

FIG. **4** is an enlarged fragmentary perspective view, partly exploded and partly in schematic, illustrating a portion of the adhesive dispenser system of FIG. **1**;

FIG. **5** is a schematic view illustrating the operation of an adhesive delivery system;

FIG. **6** is a frontal perspective view of a packaging module which may be employed in the adhesive dispenser;

FIG. **7** is a fragmentary perspective view of the packaging module of FIG. **6** from a second side thereof; and

FIG. **8** is a plan view of a pre-assembled form for an outer portion of the packaging module of FIG. **6**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An adhesive dispenser system is adapted for use with for moisture sensitive materials, such as two-part polyurethane adhesives used in the construction trades. For example, one commonly used chemical component for adhesive for which the system has particular applicability is methylene diphenyl diisocyanate (MDI)-which is moisture sensitive. The adhesive dispenser system, designated generally as **10**, employs at least one packaging module **11** which protects the pre-mixed components from moisture in the atmosphere, prevents the escape of volatile materials and ultimately substantially prevents, if not eliminates, crystallization in the pump, mixing components, conduits, delivery hoses and fixtures. The adhesive dispenser system **10** is used to facilitate the mixing and dispensing of moisture sensitive materials, as well as to ensure material integrity during shipping, pre-use storage and post-use storage.

With reference to FIGS. **6-8**, in one preferred embodiment, a packaging module unit **11** comprises an outer container body or carton **12** and an inner bag member or bladder **20** (only partially illustrated). The inner bladder **20** is made of a water-impermeable flexible sheet material and has a spout **22** which is closed by a threaded cap **24**. As described below, the cap **24** is valved and adapted for efficient connection with a conduit. The spout **20** may be truncated and have a reinforced ridged neck portion. The bladder is filled with one part of the adhesive (not illustrated) and, upon filling, substantially occupies the interior volume of the carton **12** and preferably closely conforms to the interior sides of the carton. The carton **12** is preferably a corrugated rigid or semi-rigid, box-like structure manufactured from a die cut panel **13** such as illustrated in FIG. **8**. The carton supports and protects the bladder **20** and its contents and also facilitates transportation and handling.

For storage and transportation purposes, the carton **12** includes a top side **14** to which a handle **16** is affixed. The carton also has an opening **16** in side **14** to provide access to the spout **22** and cap **24** of the bladder. Another side of the carton includes an elongated window **18** which extends to a short distance from the top surface to allow inspection of the contents of the bladder and, in particular, the amount of remaining material.

The inner bladder **20** receives and contains the moisture-sensitive material during shipping, use and pre- and post-use storage. Preferably, the inner bladder **20** is manufactured from a durable plastic material which is translucent or transparent to allow the contents to be viewed. It is preferred that the inner bladder **20** has a raised reinforced spout **22** equipped for threading with interior threads of the cap **24**. The spout **22** has sidewalls extending upwardly to form a ridged structure to an opening for the bladder. The cap **24** is pre-installed shortly after the adhesive components are placed in the bladder **20**.

In another preferred embodiment, the spout **22** is self-sealing either by use of a twist-cap, valve, or similar closing or sealing means. According to this embodiment, the spout **22** is repeatedly sealable so that the material therein remains in substantially the same condition as it was upon the first opening or first use of the material inside the bladder **20**.

In another embodiment, the carton **12** has an inside surface (not illustrated) that is covered or coated with a substantially water impermeable membrane so that the inside surface forms a substantially continuous liner member. According to this embodiment, the spout is sealed with the liner member so that any material contained within is substantially protected from moisture. Alternatively, the spout and the membrane defining the liner are manufactured as a one-piece unit.

With reference to FIGS. **1** and **2**, the packaging module **11** is especially adapted for incorporation and use in conjunction with a mobile dispenser cart **50**. The cart **50** includes a tubular support frame **52** which mounts the various dispenser components and component materials and provides mobility and efficient organization for the dispenser system. The frame **52** includes a pair of laterally spaced, angler tubular supports **53** and **55** which upwardly terminate in handlebars **54** and **56** and, at a lower rear location, receive an axle **58** for a pair of wheels **60**. The handlebars angle rearwardly at an upper rear location and include a pair of grips **64** to facilitate manual movement of the cart. A pair of laterally spaced angled tubular supports **66** and **68** extend forwardly from a medial location of the handlebars and extend downwardly to terminate at a pair of support legs **67** and **69**. The legs provide a stable support for the cart and allow the cart to be pivotally tilted for movement of the cart in hand-truck fashion whereby the wheels **60** support the cart and facilitate rolling movement.

A lateral, generally horizontal tray **70** is mounted to the support arms. The tray has a circumferential upstanding retaining flange **72**. The tray has openings **74** (FIG. **2**) as well as a pair of spaced centrally located upright position guides **76**. A pair of forward laterally spaced slots **78** are also formed in the retention flange **72**.

With additional reference to FIG. **3**, a shelf **80** extends between the supports **53** and **55** at a lower forward position adjacent the joining with supports **66** and **68** to form a generally horizontally disposed support platform. A dual inline geroter pump assembly **90** is mounted to the lower support platform. A pump unit **92** has an inlet **93** and an outlet **94**. Pump unit **96** (mounted in reverse relationship to pump unit **92**) has an inlet **97** and an outlet **98**. Inlets **93** and **97** communicate and connect via connectors with respective transparent conduits **103** and **107** which communicate with the packaging units **11** so that each part of the adhesive is generally supplied under gravity to the respective pump unit. Outlet fittings **94** and **98** connect with the dispensing/delivery hoses **104** and **108**. The pump units are driven by an electric motor **100** which is controlled by a control module **101** mounted to the rear of the tray. A skirt **102** may be mounted to the front of supports **66** and **68** to generally enclose and protect the various conduits and the pump assembly **90**.

With additional reference to FIG. **5**, the tray **70** is dimensioned and configured for receiving respective cartons **11** for the first and second parts of the adhesive. With additional reference to FIG. **4**, the cartons are configured for usage and connection by the cap **24** which has a projecting male fitting **26** and an intermediate poppet valve **28**. The carton is then

inverted so that the top side **14** rests on the tray. The carton is positioned so that the projecting male fitting **26** is received in the tray opening **74** or alignable therewith. The window **18** of the carton preferably essentially aligns with a slot **78** of the tray. An upstanding guide **76** engages one side of the carton to facilitate proper positioning. The same process is repeated for the carton **11** of the other part (for a two part adhesive).

An inverted U-shaped retention bar **118** is then mounted over the top of the tray and each module **11** to secure them in position. For applications where only one part is moisture sensitive, only one packaging module **11** may be employed.

Conduits **103** and **107** respectively extend from each inlet **93** and **97** and at an opposite end mount via a hose clamp **111** a female fitting **120**. Fitting **120** couples with the cap fitting **26** to provide an efficient snap fit connection and open the poppet valve **28** for providing a flow connection from the container bladder to the conduit without exposure to the atmosphere. The fittings which provide for the connection may be similar to that disclosed in U.S. Pat. No. 5,911,403, the disclosure which is incorporated herein by reference.

Hoses **104** and **108** connect with a mixing nozzle **110**. In one embodiment the hoses **104** and **108** are each approximately 30 feet in length. Each of the cartons may thus be connected to the pump assembly and ultimately the dispensing hoses **104** and **108** and the mixing gun assembly **110** without exposure to the atmosphere (and disconnected from the packaging module contents). The dispensing hoses **104** and **108** extend from the pump outlets **94** and **98** to provide a delivery conduit for delivery of the adhesive parts to the mixer **112**. The hoses each preferably have lever operated valve **114** at the input openings to the mixer **112**. Upon mixture of the constituent two parts, the adhesive is forced under pressure through a dispensing fixture or nozzle, such as representative wand **116** which includes a helical output path.

A bracket **130** may traverse at an upper location between the supports **53** and **55** to provide a retaining support for coiling the hoses **104** and **108** and/or power cords. The control module **101** including a switch is mounted at the rear of the tray to provide an accessible control unit for operating the pump assembly **90**.

It should be appreciated that in the event it is necessary to replace one of the components for the adhesive, replacement is relatively efficiently accomplished by disengaging the snap fit connectors **26**, **120** which, due to the poppet valve nature, does not expose the adhesive components to the atmosphere, and replacing the carton **11** with another suitable carton **11** as previously described. The pump assembly may be powered, in some instances by a gas engine (not illustrated).

What is claimed:

1. An adhesive product unit comprising a first packaging module and a second packaging module, each said packaging module comprising:

a carton having a box-like shape with one side having an opening;

a water impermeable enclosure disposed in said carton and having a spout defining a central communication axis and alignable with or disposed in said opening and enclosed by a cap disposed about said axis and having a poppet valve biased forwardly into a closed position and a male fitting extending forwardly from said poppet valve and interiorly forming a flow path from said cap;

said first packaging module having a part **1** component disposed in said enclosure and said part **1** component flows along a generally axial path from said cap upon opening said poppet valve;

said second packaging module having a moisture sensitive part **2** component disposed in said enclosure, and said part **2** component flows along a generally axial path from said cap upon opening said poppet valve,

wherein said part **1** component and said part **2** component are mixable to form an adhesive.

2. The adhesive product unit of claim **1** wherein at least one of said first packaging module and said second packaging module has a second side of a carton with a cut-out portion defining a window.

3. The adhesive product unit of claim **1** wherein at least one of said first packaging module and said second packaging module comprises a handle extending from one side.

4. The adhesive product unit of claim **1** wherein at least one of said first packaging module and said second packaging module comprises a carton having a corrugated construction.

5. The adhesive product unit of claim **1** wherein at least one of said first packaging module and said second packaging module comprises an enclosure formed of plastic.

6. The adhesive product unit of claim **1** wherein at least one of said first packaging module and said second packaging module comprises an enclosure which is transparent or translucent to allow the component to be viewed exteriorly of said enclosure.

7. The adhesive product unit of claim **1** and further comprising a conduit with a female fitting for receiving said male fitting of one said packaging module in snap-fit relationship.

8. The adhesive product unit and conduit of claim **7** wherein said female fitting comprises a stem member which engages said poppet valve of one said packaging module to open said valve.

9. The adhesive product unit of claim **1** wherein said first packaging module and said second packaging module each has a second side of a carton with a cut-out portion defining a window.

10. The adhesive product unit of claim **1** wherein said first packaging module and said second packaging module each has a handle extending from said one side.

11. The adhesive product unit of claim **1** wherein said first packaging module and said second packaging module each comprises a carton having a corrugated construction.

12. The adhesive product unit of claim **1** wherein said first packaging module and said second packaging module each comprises an enclosure formed of plastic.

13. The adhesive product unit of claim **1** wherein said first packaging module and said second packaging module each comprises an enclosure which is transparent or translucent to allow the component to be viewed exteriorly of said enclosure.

14. The adhesive product unit of claim **1** and further comprising two conduits each with a female fitting for receiving a said male fitting of a said packaging module in snap-fit relationship.

15. The adhesive product unit and conduits of claim **14** wherein each said female fitting comprises a stem member which engages a said poppet valve of a said packaging module to open a said valve.

16. An adhesive product unit comprising:

a first packaging module comprising:

a carton having a box-like shape with one side having an opening;

a water impermeable enclosure disposed in said carton and having a spout defining a central communication axis and alignable with or disposed in said opening and enclosed by a cap disposed about said axis and having a poppet valve biased forwardly into a closed position and a fitting extending forwardly from said poppet valve and interiorly forming a flow path from said cap; and

a part **1** adhesive component disposed in said enclosure; and

a second packaging module comprising:

a carton having a box-like shape with one side having an opening and being substantially identical to said carton of said first packaging module;

a water impermeable enclosure disposed in said carton and having a spout defining a central communication axis and alignable with or disposed in said opening and enclosed by a cap disposed about said axis and having a poppet valve biased forwardly into a closed position and a fitting extending forwardly from said poppet valve and interiorly forming a flow path from said cap;

a moisture sensitive part **2** adhesive component disposed in said enclosure;

wherein said part **1** adhesive component and said part **2** adhesive component are mixable to form an adhesive.

17. An adhesive product unit comprising:

a first packaging module comprising:

a carton having a box-like shape with one side having an opening;

a water impermeable enclosure disposed in said carton and having a spout defining a central communication axis and alignable with or disposed in said opening and enclosed by a cap disposed about said axis and having a valve biased into a closed position; and

a part **1** adhesive component disposed in said enclosure; and

a second packaging module comprising:

a carton having a box-like shape with one side having an opening identical in size and shape to the carton of said first packaging module;

a water impermeable enclosure disposed in said carton and having a spout defining a central communication axis and alignable with or disposed in said opening and enclosed by a cap disposed about said axis and having a valve biased into a closed position;

a moisture sensitive part **2** adhesive component disposed in said enclosure;

wherein said part **1** adhesive component and said part **2** adhesive component are mixable to form an adhesive.

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