TITLE

HANDHELD GAS SPRAY SYSTEM FOR MIXING AND DISPENSING MULTI-COMPONENT COMPOSITIONS

RELATED APPLICATION

[0001] This application claims priority from U.S. Provisional Application No. 63/068,666 filed on August 21, 2020, the entirety of which is incorporated herein by reference.

BACKGROUND

[0002] Dispensing devices, such as multi-component dispensing devices are used to mix and dispense multi-component fluids. The multi-component fluids may be sealants that need to be kept separated prior to dispensing. For example, several fluid constituents may be mixed together to form a biological sealant or adhesive. Sealants and adhesives are made by mixing each fluid component together, which react with each other to harden or set after they are mixed. Often times, the two fluid components react quickly and harden into the sealant or adhesive, such as a tissue adhesive. Because of the rapid reactivity following component contact, mixing the fluid components occurs only when the multi-component fluid is ready to be dispensed and applied.

[0003] Gas systems, or systems using propellant gas are intended for the atomization and application of fibrin sealant. In order for the sealant or adhesive to properly form, each fluid component should be well mixed before applying the multi-component fluid. For example, partially mixed fluid components may result in a sealant that does not sufficiently polymerize upon application. If the multi-component fluid hardens prior to dispensing, the dispensing device clogs and prevents flow, typically requiring replacement of a portion of the dispensing device. Furthermore, ejecting hardened components or obstructions may pose a hazard for a patient and adhesive that pre-maturely clots may not adequately seal a wound. Unfortunately, existing methods for dispensing multi-component biological sealants are often inadequate.

SUMMARY

[0003a] According to an aspect of the present disclosure, there is provided an applicator for mixing and dispensing a multi-component fluid, the applicator comprising: a fluid conveyance subassembly in fluid communication with a syringe, wherein the syringe houses at least two different sealant components; a housing; a gas cartridge disposed inside the housing; a gas valve assembly disposed inside the housing, the gas valve assembly in fluid communication with the gas cartridge and the fluid conveyance subassembly, the gas valve assembly configured to control flow of gas from the gas cartridge to the fluid conveyance subassembly; a trigger configured to actuate the gas valve assembly; and a detachable spray tip in fluid communication with the fluid conveyance subassembly, the detachable spray tip configured to dispense the multi-component fluid out of the applicator.

[0003b] According to another aspect of the present disclosure, there is provided an applicator for mixing and dispensing a multi-component fluid, the applicator comprising: a fluid conveyance subassembly in fluid communication with a syringe, wherein the syringe houses at least two different sealant components; a housing; a gas cartridge disposed inside the housing; a gas valve assembly disposed inside the housing, the gas valve assembly in fluid communication with a gas cartridge and the fluid conveyance subassembly, the gas valve assembly configured to control flow of gas from the gas cartridge to the fluid conveyance subassembly; and a trigger configured to actuate the gas valve assembly.

[0004] The present disclosure provides a gas spray device for mixing and dispensing two-component compositions (e.g., sealant). Gas systems may be intended for the atomization and application of fibrin sealant using a propellant gas. Such systems are able to generate a