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CONTRAST/SALINE REAL TIME MIXING HAND CONTROLLER

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The device is a hand controller for a multi-fluid injection system that allows both real time variability of flow rate and variability of contrast/saline mix (or of any two appropriate fluids). This device includes a multi-axis or multi-fluid injection system to receive and act upon the signals outputted by this device.

SPECIFICATION

One embodiment of the device would simply add to the utility of the current MEDRAD Avanta® hand controller, which already provides variable flow injections in Variable Flow Mode, start/stop in Fixed Flow Mode, and disposability for single use or multi-use with a sheath.

This embodiment includes a finger wheel similar to that found on a scrolling computer mouse. The finger wheel might be attached to a single or partial turn potentiometer to allow the appropriate level of mixing refinement. A tactile feel or discrete set of positions may be used to provide position feedback to the user. When turned all the way to one side the device instructs the injector system to inject 100% contrast or similar fluid. When turned completely to the opposite side the device instructs the injector system to inject 100% saline or similar fluid. When the finger wheel is positioned anywhere in between, the device instructs the injector system to inject that particular mix of contrast and saline. Common mix preferences might be 75% contrast and 25% saline, or 50% contrast and 50% saline, etc. That said, the real advantage of this device is the ability of the user to change the mix during an injection via the manipulation of the finger wheel. The injector system would make the appropriate changes in flow rates to accommodate the desired mix.

The concept of diluting contrast with saline is gaining in popularity in the medical imaging industry. Solutions for automating this process already exist, particularly in CT. However, the CV solutions to this issue are somewhat low tech. They often involve mixing by hand in either a sterile bowl or syringe. Furthermore, the next generation of injector equipment that might permit mixing may be limited in that, once the injection is started, the mixture of contrast and saline can not be adjusted. The device described here intends to leapfrog the obvious next generation of CV injector technology that might permit injecting a fixed mix of contrast and saline. Just as the operator can vary the flow rate of an injection real time with the MEDRAD Avanta® hand controller, this device will permit the real time variation of contrast/saline mix as well.

The device would be used by an Interventional Cardiologist for a diagnostic, interventional, or therapeutic procedure where the amount of contrast delivered to the patient was of utmost concern. The device would allow the user to dilute the contrast to the point where the images are still useful and reduce the overall amount of contrast delivered.

The device addresses the issue of efficacy by providing valuable images while limiting the amount of contrast delivered to the patient. This is of utmost importance for more distressed patients (diabetic, CIN, etc.). Market data shows that because CTA and MRA are being used by relatively healthier patients, the cath lab is seeing a higher percentage of distressed patients.

The device addresses the issue of efficiency by increasing the throughput of the lab. No user time is wasted by hand mixing, or hand programming a mix, or adjusting the mix rate, or switching to a saline flush, etc.

