administered to the patient is controlled in the pump by counting the number of aliquots, each being of substantially the same volume, and stopping when the number reaches an amount corresponding to the total desired volume of liquid to be delivered. Peristaltic pumps are sanitary and generally accurate and therefore very useful in the administration of medication and therapeutic liquids to the patient.

[0005] Current enteral feeding pumping methods can be ineffective when delivering thick liquids, such as nutritional liquids that have high viscosity and/or that contain solids which approximate chewed food for enteral feeding purposes (e.g. blended foods).

SUMMARY

[0005a] In an aspect, the present disclosure refers to a method of operating a flow control apparatus to deliver liquid to a subject using a pumping device of the flow control apparatus, the method comprising:

recognizing a pump set including a liquid container with a volume of liquid mounted to the flow control apparatus whereby the pump set is positioned to be acted on by the pumping device to deliver aliquots of liquid through the pump set;

initiating operation of the pumping device to draw a prescribed volume of the liquid from the liquid container for a duration of time; and

delivering a single aliquot of the volume of liquid from the liquid container to the subject and pausing operation of the pumping device for a predetermined period of time before delivering another single aliquot of the volume of liquid from the liquid container to the subject, wherein the predetermined period of time for pausing operation is within the duration of time during which an entirety of the prescribed volume of the liquid is pumped to the subject.

[0005b] In an aspect, the present disclosure refers to a flow control apparatus for use with a pump set to deliver liquid from a liquid container through the pump set to a subject, the flow control apparatus comprising:

a pumping device capable of acting on the pump set to produce a liquid flow in the pump set during a feeding cycle; and

a controller in communication with the pumping device for controlling operation of the pumping device during the feeding cycle for producing the flow of the liquid in the pump set, the controller including a processor and a memory, the controller configured to execute in the processor a feeding routine to deliver a single aliquot of the liquid from the liquid container to the subject and pause operation of the pumping device for a predetermined period of time before delivering another single aliquot of liquid from the liquid container to the subject.

[0005c] In an aspect, the present disclosure refers to a method of operating a flow control apparatus to deliver liquid to a subject using a pumping device of the flow control apparatus, the method comprising:

recognizing a pump set including a liquid container with a volume of liquid mounted to the flow control apparatus whereby the pump set is positioned to be acted on by the pumping device to deliver aliquots of liquid through the pump set;

initiating operation of the pumping device to draw a prescribed volume of the liquid from the liquid container for a duration of time; and

delivering a series of aliquots of the volume of liquid from the liquid container to the subject, wherein the series of aliquots is alternated with a series of pauses in operation of the pumping device for a predetermined period of time such that each aliquot in the series of aliquots is separated by a single pause in operation of the pumping device.

[0006] In one example, a method of operating a flow control apparatus to deliver nutritional liquid to a subject using a pumping device of the flow control apparatus generally comprises recognizing a pump set including a liquid container with a volume of liquid mounted to the flow control apparatus whereby the pump set is positioned to be acted on by the pumping device to deliver aliquots of liquid through the pump set. Initiating operation of the pumping device to draw a prescribed volume of the liquid from the liquid container for a duration of time. Delivering a single aliquot of the volume of liquid from the liquid container to the subject and pausing operation of the pumping device for a predetermined period of time before delivering another single aliquot of the volume of liquid from the liquid container

to the subject. The predetermined period of time for pausing operation is within the duration of time during which the prescribed volume of the liquid is pumped to the subject.

[0007] In one example, the method further comprises delivering an entire prescribed volume of liquid to the subject in single aliquot increments.

[0008] In one example, the method further comprises pausing operation of the pumping device for the predetermined period of time after every aliquot delivery of the aliquots making up the entire prescribed volume of liquid.

[0009] In one example, the method further comprises pausing operation of the pumping device for between about 0.5 and about 5 seconds.

[0010] In one example, the method further comprises rotating a rotor of the pumping device to engage the pump set for delivering the single aliquot of liquid to the subject.

[0011] In one example, rotating the rotor to deliver the single aliquot of liquid comprises rotating the rotor for less than a full rotation.

[0012] In one example, the method further comprises associating a delivery routine stored in memory of the flow control apparatus with the recognized pump set.

[0013] In one example, the liquid comprises a nutritional liquid.

[0014] In one example, the nutritional liquid comprises a solution of blended food.

[0015] In one example, the liquid has a viscosity of at least 50 cP.

[0016] In another example, a flow control apparatus for use with a pump set to deliver liquid from a liquid container through the pump set to a subject generally comprises a pumping device capable of acting on the pump set to produce a liquid flow in the pump set during a feeding cycle. A controller is in communication with the pumping device for controlling operation of the pumping device during the feeding cycle for producing the flow of the liquid in the pump set. The controller includes a processor and a memory. The controller is configured to execute in the processor a feeding routine to deliver a single aliquot of the liquid from the liquid container to the subject and pause operation of the pumping device for a predetermined period of time before delivering another single aliquot of liquid from the liquid container to the subject.

[0017] In one example, the pumping device comprises a rotor including a plurality of rollers configured to contact the pump set to produce the single aliquots of liquid.

[0018] In one example, the single aliquot is less than the volume of liquid that would be delivered by one full rotation of the rotor.

[0019] In one example, the single aliquot comprises the volume of liquid disposed between adjacent rollers of the rotor.

[0020] In one example, the controller is programmed to execute the feeding routine to deliver an entire prescribed volume of the liquid from the liquid container within the feeding cycle.

[0021] In one example, the controller is programmed to execute the feeding routine upon recognizing the pump set is loaded on the flow control apparatus.

[0022] In one example, the apparatus further comprises a reader operatively connected to the processor and configured to read the pump set to identify the feeding routine for delivering the liquid in the liquid container.

[0023] In one example, the controller is configured to calculate the pause between delivery of successive aliquots based on an input of the volume of liquid to be delivered to the subject.

[0024] In one example, the controller is configured to execute in the processor another feeding routine in which the pump device delivers multiple aliquots of liquid to the subject during a continuous operation of the pumping device.

[0025] In yet another example, a method of operating a flow control apparatus to deliver liquid to a subject using a pumping device of the flow control apparatus generally comprises recognizing a pump set including a liquid container with a volume of liquid mounted to the flow control apparatus whereby the pump set is positioned to be acted on by the pumping device to deliver aliquots of liquid through the pump set. Initiating operation of the pumping device to draw a prescribed volume of the liquid from the liquid container for a duration of time. Delivering a series of aliquots of the volume of liquid from the liquid container to the subject. The series of aliquots is alternated with a series of pauses in operation of the pumping device for a predetermined period of time.

[0026] In still another example, a method of operating a flow control apparatus to deliver liquid to a subject using a pumping device of the flow control apparatus generally comprises recognizing a pump set including a liquid container with a volume of liquid mounted to the flow control apparatus whereby the pump set is positioned to be acted on by the pumping device to deliver aliquots of liquid through the pump set. Initiating operation of the pumping device to draw a prescribed volume of the liquid from the liquid container for a duration of time. Delivering a series of aliquots of the volume of liquid from the liquid container to the subject. The series of aliquots is alternated with a series of pauses in operation of the pumping device for a predetermined period of time without any additional pauses between aliquots of the volume of liquid in the duration of time while the prescribed volume of liquid is pumped to the subject. The series of aliquots and the series of pauses in operation are at uniform intervals within the duration of time during which the prescribed volume of the liquid is pumped to the subject.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] Fig. 1 is a fragmentary, perspective view of the feeding system including the enteral feeding pump, and part of the feeding set assembly;