This invention relates to a plumber's snake device of the type that is power driven.

Known devices of this type feed and withdraw the flexible pipe-cleaning snake by means of a reversing motor. To stop the feed of such prior devices, it is necessary to cut the motor circuit or otherwise free the snake to stop its rotation and/or feed movement.

The present invention has for an object to provide a plumber's snake that is both simpler in construction and operation than prior devices in that reversing motors are not required nor are clutches and other such expensive devices needed, the invention contemplating a device that uses an ordinary unidirectional motor and provides the operator with a simple controller to effect change between feed and retraction only while the motor is operating.

Another object of the invention is to provide a plumber's snake, as above characterized that, by means of the mentioned controller, can stop feed or retraction movement while the motor is operating.

A further object of the invention is to provide a plumber's snake of the character referred to that automatically stops feed or retraction movement, as the case may be, when the same encounters an abnormal obstruction, when feeding, or a fixed stop, when retracting.

This invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiorit and serviceability.

The foregoing objects are realized in a snake construction that uses a uni-directional motor that rotates the pipe-cleaning snake and is held by one hand by means of a piston grip which has a trigger to open and close the motor circuit. An extension is provided to guide the snake, the same being provided with a gear train that is driven by the motor as the latter rotates the snake. A controller is carried by said extension, the same, under control of the operator's other hand, being selectively movable to one of three positions to allow snake rotation without feed or retraction, and either feed or retraction, as desired. The device is handled much in the manner of a tommy gun with all the control advantages afforded by such a two-handed device.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description and which is based on the accompanying drawing. However, said drawing merely shows, and the following description merely describes, one embodiment of the present invention, which is given by way of illustration or example.

In the drawing, like reference characters designate similar parts in the several views.

FIG. 1 is a side elevational view of a plumber's snake device embodying a preferred form of the present invention.

FIG. 2 is an enlarged top plan view of the present feed and retraction means shown in neutral or non-feeding position.

FIG. 3 is a longitudinal sectional view of the means shown in FIG. 2 and shown in snake-feeding position.

FIG. 4 is a side elevational view of said feed and retraction means shown in snake-retracting position.

FIG. 1 shows a motor 5 provided with a piston grip 6 which has a trigger 7 that controls operation of the motor. A housing 8 is mounted on the motor for housing the coiled-up portion of a snake 9 at the end of which is provided a cutter tool 10 designed to cut through vegetation, roots, and other material that may clog pipes, particularly, sub-soil plumbing. The above is generally typical of one form of plumber's snake, the motor 5 rotating the snake 9 and the housing 8, the latter including means for forming convolutions of the snake within the housing for storing the retracted portion of the snake. The present invention is not concerned per se with the above-described components 5 to 8 except that the grip 6 affords one means of support for the device and the motor 5 provides a source of power for rotating the snake 9 and driving the present improved means 11 for feeding or retracting said snake, as desired.

The present snake-controlling means 11 comprises, generally, a frame 12 that is fixedly extended from the housing of the motor 5 forwardly from the rotatable housing 8, a controller 13 carried by the frame 12 to drive the snake 9 in a feed or a retractive direction, selectively, the same including a handle 14 that, together with the piston grip 5, provides the operator with means to direct the present device and hold the same in operative position during feed or retraction of the snake, means 15, driven by the motor 5, to drive the controller, and detent means 16 to releasably retain the controller in feed, retraction or neutral positions, as desired.

The frame 12 is shown as having an inner end 20 that is fixedly connected by a sleeve 21 to the motor 5, an outer end 22, and side walls 23 that connect said ends 20 and 22. A filler piece 24 outward of the end 20 and said end 22 define between them a space 25 in which the controller 13 is disposed and is operably movable. The end 22 and the filler piece 24 are provided with aligned bores 26 through which the snake 9 extends and in which said snake is both freely rotational and longitudinally movable. Said bores may be bushed, if desired.

The controller 13 is shown as a body 27 mounted on a pivot 27a in the side walls 23 of the frame 12 and is movable on said pivot in a plane through which the axis of the snake extends, and a pair of similar drive wheels 28 and 29, disposed in said plane and mounted in the body 27 on pivots 30. Said pivots 30 are so spaced on each side of the pivot 27a, and the diameters of the wheels 28 and 29 are so proportioned to said space that, with the body 27 in the position of FIG. 1 wherein the same extends perpendicularly to the axis of the snake 9, the wheels 28 and 29 are spaced from said snake. As seen best in FIG. 3, the body 27 is formed with a passage 31 through which the snake extends and recedes 32 in which the wheels 28 and 29 are accommodated.

The snake 9 is shown as having an outer helical sheath formed of a close-wound coil of round wire. The wheels 28 and 29 are each formed with a transversely and concavely curved outer wall in which circumferentially arranged seats 33 are provided, the same interfitting with the convolutions or coils of the snake to effect, when the body 27 is moved on its pivot 27a, in one direction or the other, as shown in FIGS. 3 and 4, feed or retractive movement of the snake.

The wheels 28 and 29 are formed with flanges 34 provided with gear teeth that are in mesh with each other. Hence drive of one wheel will cause drive of the other. As shown best in FIG. 3, said wheels engage opposite sides of the snake, one wheel being forward of the other, i.e., the two wheels, when in snake-driving position (FIGS. 3 and 4) are not directly opposite each other, nor do they engage directly opposite portions of the snake. The engagement with the snake is made with longitudinally spaced portions of said snake, as can be seen.
The drive means 15 is shown as a bevel gear 35 that is coaxial with and within the sleeve 21 and driven by the motor 5, a bevel gear 36 driven by the gear 35, a reducing gear train 37 driven by the gear 36, and a pinion gear 38 at the end of said gear train. The latter is disposed in the plane of the gear flanges 34 of the wheels 28, is out of mesh with said flanges when the controller is in the neutral position of FIG. 1, and is in mesh with one or the other flange 34 according to the direction of tilt of the pivot 30 of the controller. Thus, when the body 27 is tilted to the position of FIG. 3, the pinion 38 is in mesh with the gear flange of wheel 29 on one side of the snake and, when the body 27 is tilted to the position of FIG. 4, the pinion 38 is in mesh with the gear flange of wheel 28 on the opposite side of the snake. Thus, as indicated by the arcs of rotation of the wheels 28 and 29, the same driving the snake 9 in opposite directions depending on the position to which the controller is moved by its handle.

In the present case, the gear train 37 is arranged to cause rotation of the pinion gear 38 in a direction that will rotate the wheel 29 in a feed direction when the gear flange thereof is in mesh with said pinion gear. Therefore, be in a forward position along the snake 9 and the wheel 29 in a rearward position, as shown in FIG. 3. As a consequence, should the cutter tool meet an obstruction greater than may ordinarily be expected, the forward progress of the driven snake will be arrested. This will cause the snake to buckle or bend in the pipe it is cleaning, as well as in the portion between the bores 26. The buckled snake will act on the forward driving wheel 28, forcing the same in a rearward direction and the controller from its feed position to the neutral position of FIG. 1 where the drive on the snake is released. The operator will feel this buckling action and will be aware of the need for such action on the controller as will save the snake and its tool from damage or damage of the pipe being cleaned.

The detent means 16 is provided for the two-fold purpose of retaining the controller in set position and enabling the controller to return to the neutral position when the snake is subject to a resistance that will buckle it as above indicated. Said means 16 is shown as a spring biased detent element 39 on the frame 12 and a set of three seats 40 in the controller body 27 selectively engaged by said element to releasely hold the controller in set position.

It will be understood that the snake 9 rotates all the time that the motor is operating and that the drive engagement of the wheels 28 and 29 therewith is only for causing longitudinal movement of the snake.

While the foregoing has illustrated and described what is now contemplated to be the best mode of carrying out the invention, the construction is, of course, subject to modification without departing from the spirit and scope of the invention. Therefore, it is not desired to restrict the invention to the particular form of construction illustrated and described, but to cover all modifications that may fall within the scope of the appended claims.

Having thus described this invention, what is claimed and desired to be secured by Letters Patent is:

1. In a plumber's snake device having a motor to rotate the flexible snake element thereof and with a pistol grip to hold one end of the device, (a) an extension frame fixedly carried by said motor, (b) a controller adjusibly pivotally carried by said frame with a passage through which the snake element extends, (c) a pair of drive wheels carried by the controller on opposite sides of the snake element, said drive wheels being geared to rotate together, and (d) a gear train driven by said motor and terminating in a pinion gear that has a geared connection with one or the other of said drive wheels according to the adjusted angle of the controller, said drive wheel moving the snake element in a feed or retractive direction according to which drive wheel is driven by said pinion gear.

2. In a plumber's snake device according to claim 1, in which the drive wheels are disposed equidistant from the pivot of the controller, and one of said wheels being longitudinally from the other when the controller is adjusted to an angle at which both wheels are engaged with the snake element to drive the same.

3. In a plumber's snake device according to claim 1, the controller being provided with a handle for manual control of adjustment of the controller, said handle and the mentioned pistol grip combining to comprise means whereby the device is manipulated during operation thereof.

4. In a plumber's snake device provided with a rotational, flexible snake element, (a) a driven gear train terminating in a pinion gear disposed alongside said element, (b) a controller housing mounted on a pivot to be manually movable in a plane parallel to the snake element, said housing having a passage through which the snake element extends, and (c) a pair of drive wheels on axes on opposite sides of the snake element, each wheel having a gear flange and said flanges being in mesh so said wheels turn together,

5. In a plumber's snake device having a motor to rotate the flexible snake element thereof and with a pistol grip to hold one end of the device, (a) an extension frame fixedly carried by said motor, (b) a controller adjusibly pivotally carried by said frame with a passage through which the snake element extends, (c) a pair of drive wheels carried by the controller on opposite sides of the snake element, said drive wheels being geared to rotate together, (d) a gear train driven by said motor and terminating in a pinion gear that has a geared connection with one or the other of said drive wheels according to the adjusted angle of the controller, said drive wheel moving the snake element in a feed or retractive direction according to which drive wheel is driven by said pinion gear,

(e) and releasable detent means to retain the controller in angularly adjusted position and releasably by the force imposed on one of the drive wheels, when the snake element buckles during feed or retractive movement, to move the controller to a non-driving position.

6. In a plumber's snake device provided with a rotational, flexible snake element, (a) a driven gear train terminating in a pinion gear disposed alongside said element, (b) a controller housing mounted on a pivot to be manually movable in a plane parallel to the snake element, said housing having a passage through which the snake element extends, (c) a pair of drive wheels on axes on opposite sides of the snake element, each wheel having a gear flange and said flanges being in mesh so said wheels turn together, (d) said gear flanges being in the plane of the mentioned pinion gear whereby upon pivotal movement of the control in either direction to bring the wheels into driving engagement with the snake element, one of the gear flanges will be engaged with and driven by said drive wheel.
of the gear flanges will be engaged with and driven by said pinion,
(e) and releasable detent means to retain the controller housing in set position on its pivot and releasable by the force imposed on one of the drive wheels, when the snake element buckles during longitudinal movement thereof, to move the controller to a non-driving position.

7. In a device according to claim 6, the drive wheels being spaced from the snake to be clear thereof when the controller housing is disposed normal to the snake element.

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