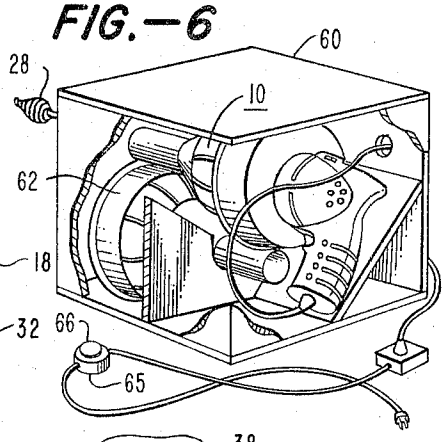
Aug. 30, 1966 B. J. BOLLINGER 3,268,937

POWER DRIVEN PLUMBER SNAKE

Filed June 1, 1964 2 Sheets-Sheet 1

FIG.—6



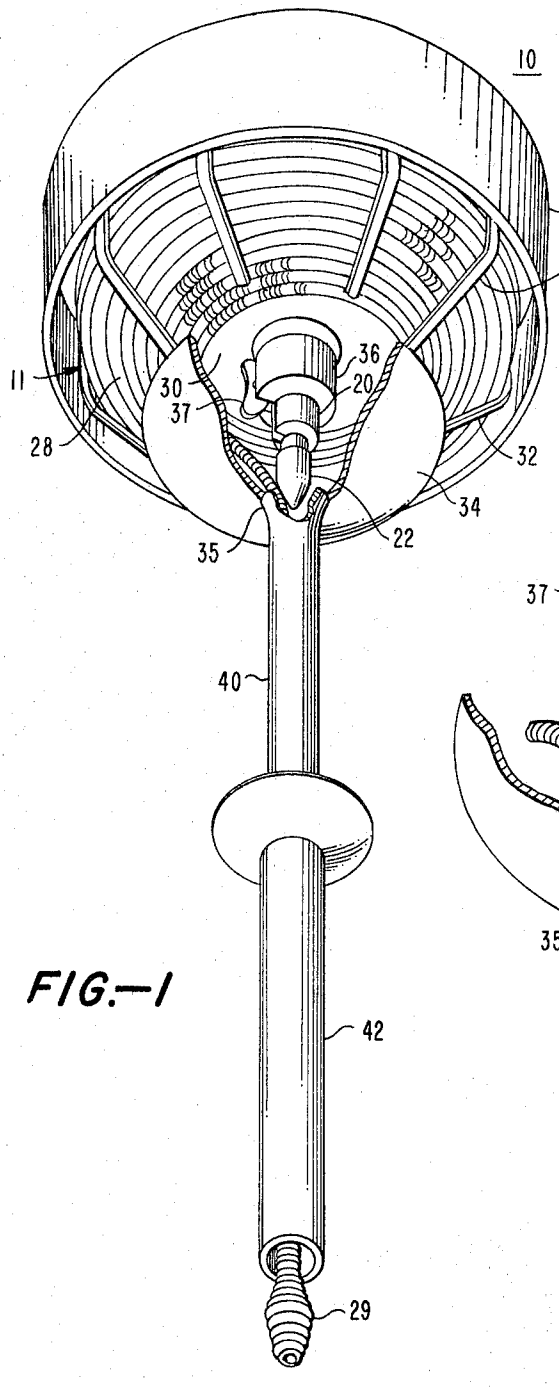


FIG.—1

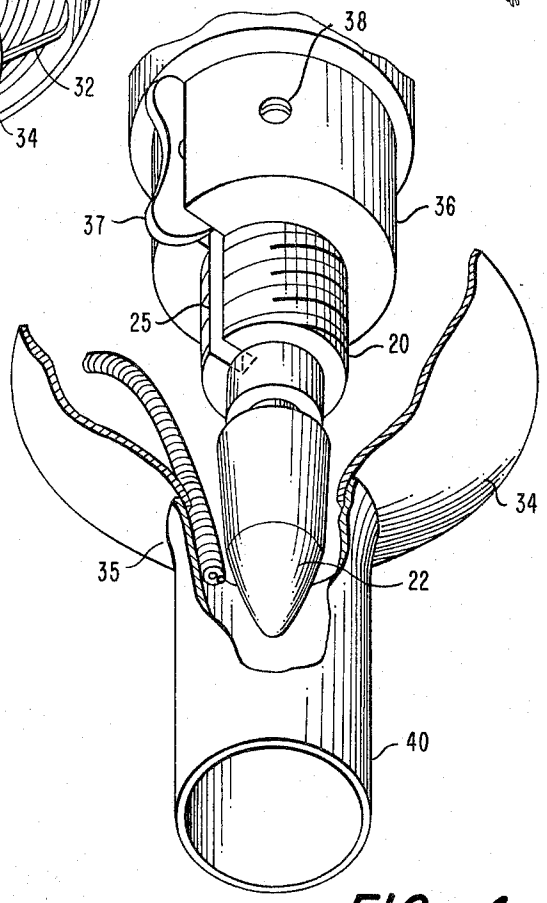


FIG.—4

INVENTOR.
BURTON J. BOLLINGER

BY Fraser and Boguchi

ATTORNEYS

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POWER DRIVEN PLUMBER SNAKE

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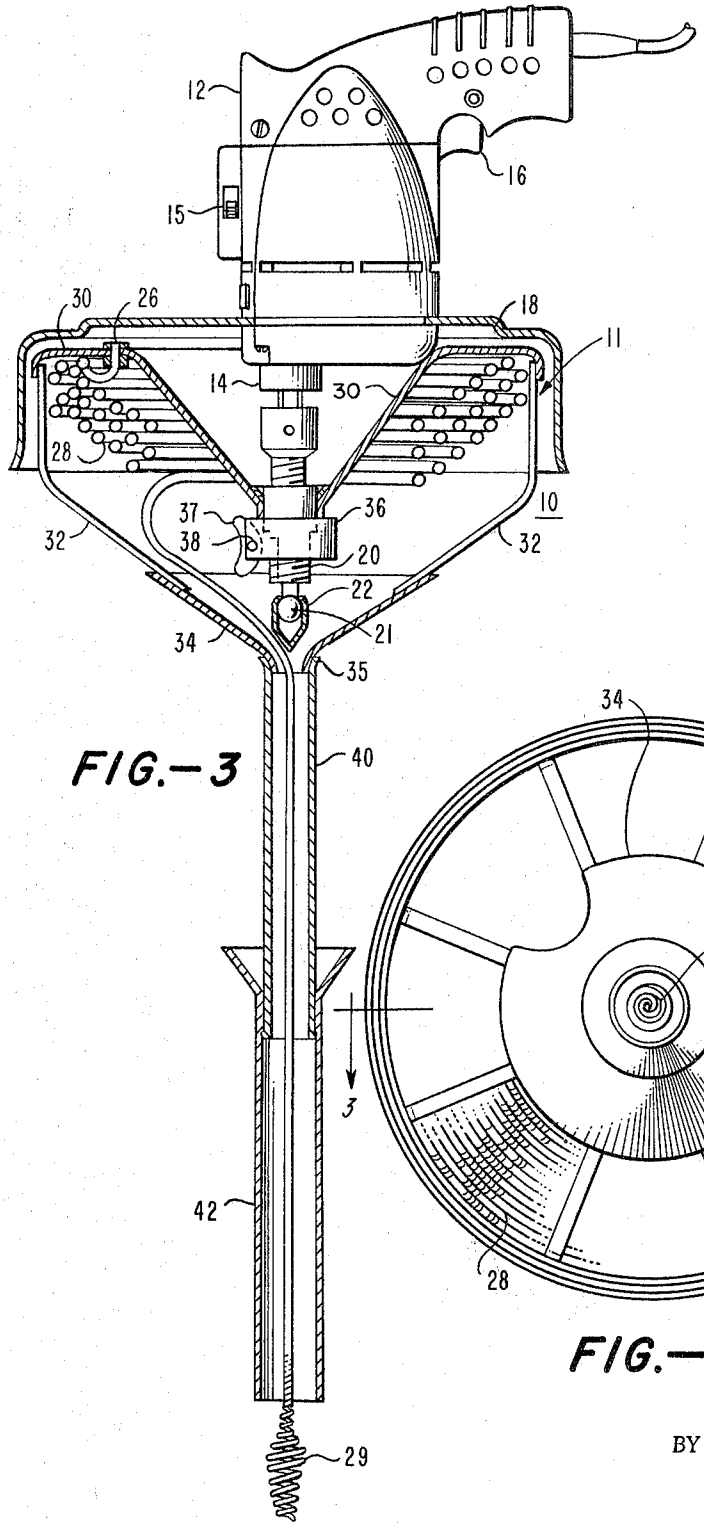

FIG.—3

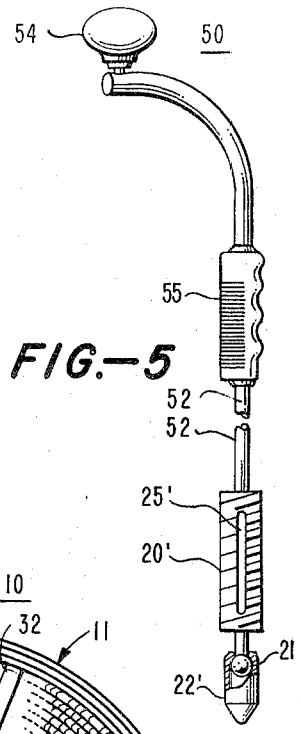

FIG.—5

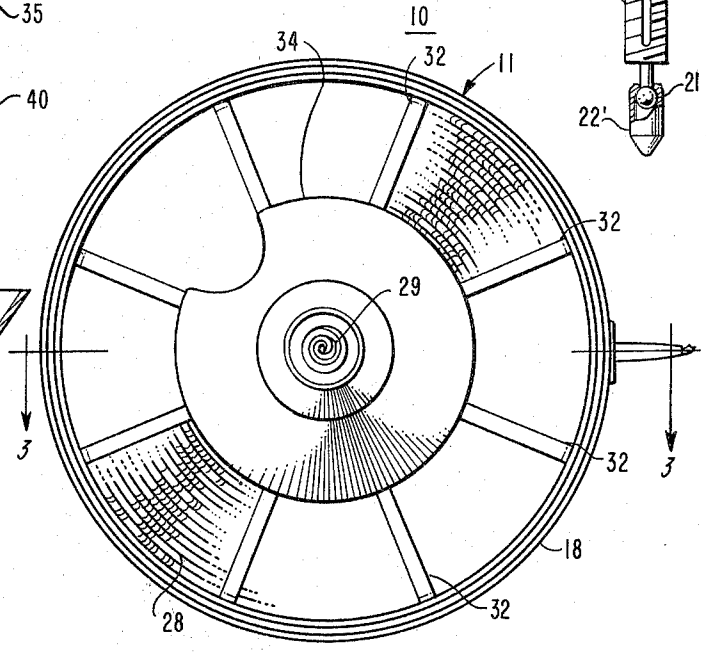

FIG.—2

INVENTOR.
BURTON J. BOLLINGER

BY Fraser and Bogucki

ATTORNEYS

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POWER DRIVEN PLUMBER SNAKE

Burton J. Bollinger, 10232 Tinker Ave., Tujunga, Calif.

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20 Claims. (Cl. 15—104.3)

This invention relates to drain and waste pipe cleaner devices and more particularly to a hand operated, power driven, flexible cable type of cleaner device for small diameter sanitary drain or waste lines.

Cleaning tools for small diameter drains or waste pipes, and which are usually entered into the drain or line through a plumbing fixture, drain receptable or fixture trap, are in wide use. Such tools utilize a flexible but strong cable having an attached head auger that is inserted in the pipe system which is to be cleaned. The cable, which is usually referred to as a snake, is typically in the form of a helically wound element which can be rotated about its longitudinal axis without substantial uncoiling. The snake is also flexible in the lateral direction, however, to the extent that it is free to follow a small conduit, but not so supple that it buckles within the conduit. Thus, the snake can be inserted within a conduit and advanced within the conduit until the head encounters a trap or an obstruction. Then, the head auger can be worked through the trap or obstruction by repeated forceful rotation and lengthwise thrusting. Because of the varying sizes of conduit that may be encountered, the different degrees of bend in the conduit and the types of obstructions which are likely to be presented, different snake diameters may be required for different applications. When power driven by hand-held electric tools, devices of this character are referred to as elecrtic hand snakes.

Many of the power driven mechanisms are so heavy and complex that they must be mounted on a wheeled structure for transport to and from working positions. In these larger devices a length of snake is coiled in a cage or drum, which is normally closed except for a relatively small opening for the snake. The snake is fed through an engaging clutch which can be rotated with or separately from the drum, so that the snake may be advanced along its longitudinal axis by using the outer helical groove as a lead screw.

Hand-held, electrically powered mechanisms for the same purpose utilize a hand power tool as the source of motive power. The snake is fed from a rotating cage through a chuck which may be engaged or disengaged to rotate the snake with the cage as desired. Such prior electric hand snakes suffer from a number of disadvantages and usually lack one or more of a number of desirable features. The tools usually operate at high rates of speed, and the length of cable between the end of the cable housing and the drain opening is loose and apt to whip. Additionally, the cage constitutes an exposed rotary member which is inconvenient to the operator and which splashes water undesirably. Further, the snake is usually loose within the cage. The hand tools also do not permit interchange of snake sizes without complete unreeling of one size and reeling in of another size. Because the cage rotates and the chuck must be manually engaged, the assembly must be held by an operator at all times. In the event of power failure, the snake is not usable.

The speed and ease with which a power driven snake

member may be used under various practical conditions is of course of primary importance. When no obstructions or confined paths are encountered, a snake may be fed at a relatively high speed. With a hand tool, it is sometimes desirable to rotate the cage while feeding out snake by hand. On reaching an obstruction, however, the power drive must rotate the snake continuously while longitudinal thrust is simultaneously exerted along the length of the snake. For convenient feeding of the snake and handling of the power tool, it is usually necessary to hold the power tool some distance away from the mouth of the conduit being cleaned, until the obstruction is penetrated. This tends to leave a length of unsupported snake cable between the tool and the conduit for a time, the unsupported length being subject to buckling when longitudinal thrust is exerted on the snake. With prior mechanisms, considerable skill must be exerted to prevent buckling under these conditions.

At the same time, there are other desirable features for mechanisms of this type. A closed cage arrangement, for example, makes it difficult to clean and inspect the snake. It is also desirable to have some sort of splash protection as the cage is rotated, particularly if an open cage is used. This splash protection should preferably, with hand operated tools, be provided by a stationary member. Along with this, it is sometimes desirable that the device be usable as a stationary unit. For some applications, the operator may prefer to operate the device by use of a foot switch, while feeding and guiding the snake manually using both hands. The mechanisms which employ manually operated chucks or rotating cages obviously are unsuited for such situations.

It is therefore an object of the present invention to provide an improved power driven hand type of conduit cleaner using a flexible cable.

Another object of the invention is to provide an improved electric hand snake which may be electrically controlled to provide different modes of operation.

Yet another object of the present invention is to provide an extremley versatile hand-held power snake mechanism having a stationary housing and means to avoid cable whipping.

A further object of the invention is to provide a power snake mechanism which can be operated by hand if desired.

Another object of the present invention is to provide a versatile power driven snake member which may be arranged for manual operation, and which also permits ready interchange of snakes of different sizes.

Power driven conduit cleaner mechanisms in accordance with the invention utilize an interchangeable cage construction, together with a drive member centrally disposed along the axis of the cage. The drive member is advanced or retracted relative to the cage, so as to selectively engage the snake and cage to the drive mechanism. Alternatively, the cage and snake may be locked so as to rotate with the drive member, although leaving the snake free for manual withdrawal from the cage. The arrangement thus provides an automatic chucking mechanism controlled solely by the power switch, although at the same time the rotating elements are protected by a stationary outer structure.

In a specific example of an electric hand snake in accordance with the invention, a hand-held power tool is engaged to selectively rotate a drive screw in the form

of a threaded shaft member having a resilient, bullet-nosed locking tip, and a longitudinal slot extending along a part of its length. An open cable cage assembly containing a snake cable of a selected diameter and having a forward neck portion with a cone-shaped exit aperture for feeding the snake cable in and out of the cage is supported on the drive screw by a hub-shaped screw holder. The screw holder is disposed on the central axis of the cage assembly and has a central aperture which is threaded to receive the drive screw. A two-position lock member mounted on the screw holder may selectively be manually engaged in the outer slot in the drive screw. The cable is fed out of the exit aperture in the neck portion of the cage assembly through a fixed inner guide tube, about which is positioned a telescopically movable outer tube. A fixed outer container or splash pan is affixed to the housing of the power tool and arranged to encompass at least a part of the outer periphery of the cage assembly when the power tool and cage assembly are engaged for operation.

For this arrangement, any cage containing a suitable size of snake may be mounted on or removed from the drive mechanism. An automatic chucking operation is achieved by control of the tool rotation, because the drive screw may be advanced within the screw holder to wedge the locking tip and the snake against the cage, or reversed to withdraw the drive screw and to free the snake. For normal snake feeding operations, in which no substantial obstruction is encountered, the mechanism is used with the telescoping tube in its retracted position, and with the locking tip on the drive screw out of engagement with the snake and the cone-shaped aperture of the cage. The snake may then be fed out by hand. The cage and the snake may also be rotated together by pivoting the two-position locking member down into the slot extending longitudinally along the drive screw. Actuation of the power tool in a given direction then rotates the cage, and the snake may be withdrawn rapidly from or returned to the cage during rotation in this manner. If desired, the tool can be operated in a separate mode, by using the lock and power switch as an automatic chuck. In this mode, the snake is fed into a conduit by hand. When an obstruction is encountered the snake is rotated with the cage by the power drive, and forced through to the other side of the obstruction. The power can then be turned off and the cable advanced by hand until the next obstruction. This mechanism may therefore be retained in a holder or within a case, and the automatic chucking feature can be used with a foot switch, leaving both hands free to manipulate the snake cable. By completely enclosing the structure the problems of splashing are eliminated, although at the same time the open cage arrangement has the advantage of permitting easy cleaning and fast drying. The stationary splash pan may be mounted within separate parts of a hand tool having a gear reduction drive and which therefore is much more readily controllable than prior mechanisms.

For interchange of cable sizes, the power tool need merely be rotated in reverse and the drive member withdrawn out of the cage, and thereafter threaded into the screw holder of a new cage containing a different size of snake cable. The mechanism is seen to be such that a manual drive screw arrangement will readily substitute for the power driven drive screw.

A better appreciation of the invention may be had by reference to the following description, taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view, partially broken away, of a power driven cable cleaner mechanism in accordance with the invention;

FIG. 2 is an end view of the mechanism of FIG. 1;

FIG. 3 is a side cross-sectional view, taken along the line 3—3 of FIG. 2, of the arrangement of FIG. 1;

FIG. 4 is an enlarged fragmentary view of the locking mechanism of the arrangement;

FIG. 5 is a side-sectional view of an alternative arrangement, showing a manual drive mechanism which may be utilized with a given cage in place of the power tool shown in FIG. 3;

FIG. 6 is a perspective view, partially broken away, of a conduit cleaning installation, showing the manner in which the assembly may be substantially completely enclosed and operated by a foot switch.

An electric hand snake type of conduit cleaner **10** in accordance with the invention, referring now to FIG. 1, may be operated with a hand held power tool **12** such as is best seen in FIGS. 1 and 3. This may be any conventional type of power tool, but it is preferred to employ a mechanism utilizing a double gearbox in its forward end and providing an operating speed of approximately 275 r.p.m. A drive hub **14** is mounted on the output end of the power tool **12** to provide coupling to the members to be driven. If desired, this drive hub **14** may be integral with the members described below, and fixed to the power tool **12** shaft by a set screw or other conventional means (not shown in detail). The power tool **12** is controlled in known fashion by a forward-reverse switch **15** and an on-off, trigger-type control switch **16**. An external housing in the form of a splash pan **18** is mounted fixedly to an intermediate point on the power tool body, although the splash pan **18** may also be removable or dispensed with entirely, if desired for certain uses. To mount the pan **18**, the body may be separated and reassembled with the pan **18** inserted. The slight additional gear separation does not affect operation of the tool.

The principal drive element which is attached to the drive hub **14** of the power tool **12** is a drive screw **20** having external threads and terminating in a ball end **21**. A resilient locking member in the form of a bullet-shaped tip **22** is mounted to swivel on the ball end **21** of the drive screw **20**. The drive screw **20** also includes a longitudinal slot **25** milled along the line of its outer periphery.

An open cage assembly **11** for the electric hand snake includes a cone-shaped inner portion **30** having a flat, extended outer ring to which are attached a plurality of outer rods **32** forming part of the face portion of the cage. As best seen in FIG. 3, a unitary assembly is provided by a forward cone-shaped member **34** including a neck portion **35** defining a central aperture about the central axis of the cage assembly. The rods **32** extend between the outer ring and the forward member **34**. It will be noted that the inner cone **30** also contains a central aperture about the central axis. The inner end **26** of a snake cable **28** of a given diameter is fixedly coupled to the inner cone **30**, and coiled within the cage assembly **11** to a desired length, with the free end extending outwardly through the tip **35** in the forward cone **34**. The free end terminates in an auger head **29** of enlarged size and appropriate shape for the cleaning function desired. The cage assembly **11** is arranged to receive the drive screw **20** through an internally threaded screw holder **36** of hub shape which is mounted within the central aperture of the inner cone **30**, as best seen in FIGS. 1 and 3. The screw holder **36** includes a longitudinal slot within which a locking lever **37** is pivotally mounted. A cap screw **38** mounted in the screw holder **36** may engage the locking lever **37**, and be tightened to provide positive positioning of the locking lever **37**. An inner fixed tube **40** is integrally coupled to the neck portion **35** of the forward cone **34** of the cage assembly **11**, and extends outwardly from the cage assembly **11** along the central axis of the device **10**. An outer telescoping tube **42** having a flared base is concentrically mounted with a sliding fit about the inner tube **40** and includes an internal circumferential ridge which is engageable to an external circumferential ridge on the inner tube **40** to provide a limit stop at the ex-

tended position of the telescoping tube 42. The flared base of the telescoping tube 42 registers with the forward cone member 34 on the cage assembly 11.

Operation of the device of FIGS. 1–4 is typically as follows. To couple the power tool 12 to the cake assembly 11 and provide a drive for the snake cable 28 the direction control switch 15 on the power tool 12 is set for forward rotation and the power tool 12 is turned on by the trigger control switch 16 as the drive screw 20 is inserted within the screw holder 36 at the central aperture of the inner cone 30 of the cage assembly 11. When the locking tip on the drive screw 20 has reached some intermediate point, at which it is not obstructing the free egress of the snake 28 from the aperture in the neck portion 35 of the cage assembly 11, the snake 28 may be fed out. This may be done manually, and with or without rotation of the cage. For cage rotation to achieve faster reeling or unreeling the cage assembly 11 is aligned so that the locking lever 37 is in the same longitudinal plane as the slot 25 along the drive screw 20. Then the operator reaches through the opening in the rods 32 at the face of the cage assembly 11 and moves the locking lever 37 into the slot 25 in the drive screw 20, engaging the cage assembly 11 to the drive screw 20 so that the cage assembly 11 can be rotated by the power tool 12. The telescoping tube 42 is held in its retracted position as the snake is paid out and the head auger 29 is fed down into the mouth of the conduit which is to be cleaned.

In feeding the snake 28 through relatively open lengths of sewer line, the structure 10 is in this mode held by the handle of the power tool 12 with one hand, as the snake 28 is stripped from the reel within the cage assembly 11 with assembly 11 rotating or stationary.

When an obstruction is encountered in the conduit, however, the head auger 29 can penetrate no further, and the snake 28 may begin to buckle in the exposed space between the mouth of the conduit and the end of the tubes 40, 42. Accordingly, at this point it is necessary to switch to the combined rotation and thrusting mode of operation, and this is effected very simply by mechanisms in accordance with the invention. The drive screw 20 is rotated forwardly by the tool 12 as the cage assembly 11 is held against rotation until the drive screw 20 reaches its extreme forward position within the cage assembly 11. At this position, the resilient tip 22 on the extremity of the drive screw 20 engages the conforming aperture within the neck portion 35 of the forward cone 34 of the cage assembly 11, and wedges and fixedly clamps the snake 28 against the neck portion 35. Therefore, the cage assembly 11, the snake 28 and the drive screw 20 are held together. Actuation of the power tool 12 in the forward direction rotates the head auger 29 on the snake 28. During this rotation, the tool is thrust forward by the operator, to work the auger 29 through the trap or obstruction. Although the tool may be held away from the mouth of the conduit, the telescoping tube 42 may now be extended forwardly, and held as the cage assembly 11 rotates. Therefore, the snake 28 may be rotated and forced through the obstruction under longitudinal force although being constrained against buckling and whipping. The automatic chucking feature is derived from the fact that reversal of the direction of rotation withdraws the locking tip 22 from the neck 35 releasing the snake 28. The snake 28 may thus be driven under power or released simply by change of motor direction.

Once the conduit is cleaned, it is only required to withdraw the snake 28 from the conduit, and this is accomplished by reversing the rotation of the drive screw 20 while maintaining the cage assembly 11 relatively immobile, until the resilient tip 22 is clearly out of engagement with the snake 28. The snake 28 can be fed back with the cage assembly 11 stationary or the locking lever 37 may then again be engaged in the slot 25, so that the cage assembly 11 can be rotated to permit faster reeling of the snake from within the conduit. When the

snake 28 has again been reeled to the starting position, the locking lever 37 may be released if locked, and the drive screw 20 rotated to be retracted from the cage assembly 11 simply by actuating the power tool 12 in the reverse direction. The snake 28 may then be inspected and cleaned through the open face of the cage assembly 11. The open cage construction is advantageous as well because the mechanism dries more readily and rapidly. In cold climates the snake often becomes frozen in the cage, a problem which is greatly reduced and much more readily corrected by devices in accordance with the invention.

During conduit cleaning operations, protection from the rotating cage assembly 11 is afforded to the operator by the stationary outer splash pan 18. Consequently, there is a combination of useful features which are not provided by prior art devices. The automatic chucking feature, plus the telescoping front tube, permit an operator to meet each different operating condition with a simple adjustment.

With mechanisms in accordance with the invention, it is now convenient to utilize a single power tool with a number of different cage assemblies, each of them having a different length and diameter of snake cable. In previously known devices, the entire snake had to be unreeled, and a new snake size reeled in. Note that the structure of the arrangements of FIGS. 1–4 is such that the power tool can be manually disengaged from the cage assembly in the event that this is desirable, simply by rotating the cage assembly until the drive screw of the power tool is released. In the event that power is not available or the tool fails, a manual drive mechanism as shown in FIG. 5 may alternatively be used. The manual drive mechanism 50 of FIG. 5 includes an elongated member 52 having an offset rotatable turning handle 54 at one end, and an intermediate support handle 55. At its opposite end, the elongated member 52 is provided with a drive screw 20′, and a longitudinal slot 25′, in the manner of the drive screw 20 of FIGS. 1–4. At the termination of this member, a ball pivot 21′ is provided which supports a resilient, bullet-shaped locking tip 22′ in the fashion of the arrangement previously described.

The manual drive mechanism 50 of FIG. 5 may be inserted by threading into the cage assembly 11 of FIGS. 1–4 and locked by movement of the locking lever 37 into the slot 25′. When a trap or obstruction is encountered, the drive screw 20′ is rotated relative to the cage until the swiveled tip 22′ is engaged firmly to the snake 28 and to the lower cone 34 of the cage assembly. Then a combined rotational and longitudinal forcing is commenced to urge the auger through the obstruction as described for the power driven arrangement. The telescoping tube 42 and the automatic chucking feature may again be utilized as previously discussed, and no modification of the cage assembly, or change of reels, is needed.

The advantages and versatility of the present device are evident in the example of use illustrated in FIG. 6. Here the cleaner 10 is mounted within a carrying case 60, with the snake 28 extending through an aperture in the case. A separate cage 62 having a different size snake may also be stored and transported within the case. The controls for the motor of the power tool are externally connected to a conventional foot switch 65 having an on-off lever 66.

To work in a confined space, or under special conditions, therefore, the operator can control clutching by means of the foot switch 65, while manipulating the snake 28 with both hands. The locking lever is first engaged, so that the snake 28 rotates whenever the tool is turned on. The operator can then feed the snake manually into the conduit until an obstruction is reached. At this point the switch 65 is operated, and the snake 28 is rotated under power to clear the obstruction, after which it may be again fed manually. Alternatively, the foot switch may be arranged with the motor circuits to provide a forward-reverse control, and operation similar to

that described above in conjunction with FIGS. 1–3. The system is not only compact and fully protected but also completely ensures against water splash during operation.

While there have been described above and illustrated in the drawings various form of cable-type conduit cleaners in accordance with the invention, it will be appreciated that the invention is not limited thereto. Accordingly, the invention should be considered to include all modifications, variations and alternative forms falling within the scope of the appended claims.

What is claimed is:

1. A conduit cleaner mechanism for driving a flexible cable comprising a cable cage having a threaded rear aperture and a front aperture, a cable normally wound within the cage and extending through the front aperture, a drive means extending into the cable cage including a shaft threaded to mate with the rear aperture and a terminal portion adapted to engage the periphery of the front aperture of the cable cage at an extreme forward position therein, said shaft being threadable along said rear aperture to provide different extends of insertion within said cable cage, means mounted on the drive means for engaging the cable cage at a selected extent of insertion thereof, and power means coupled to the drive means and independent of said cable cage for rotating the drive means to said extreme forward position, thereby to rotate the drive means, cable and cable cage in locked relation.

2. The invention as set forth in claim 1, and including in addition a stationary splash plate coupled to the power means and at least partially encompassing the cable cage, and a telescoping tube mechanism mounted on the cable cage and extending from the front aperture thereof.

3. A conduit cleaner mechanism for driving a flexible cable within a conduit comprising a cage assembly adapted to contain a length of flexible cable, a rotatable drive member adaptable for insertion into a central portion of the cage assembly, said drive member forcibly engaging said cable and said cage assembly in an extreme position therein, locking means attached to the cage assembly for locking the drive member at selected positions therein, and means coupled to said drive member for rotating said drive member and said cage assembly in order to effect the rotation of the flexible cable which may be extended from the cage assembly into a sewer conduit.

4. A conduit cleaner mechanism for driving a flexible cable within a conduit comprising a cable cage assembly, a flexible cable normally coiled within said cage assembly and coupled thereto, the cable cage assembly including an aperture through which said cable extends, and rotatable drive means coupled to said cage assembly, said drive means including means for engaging the cage assembly alone and rotating said cage assembly therewith, and further including means for engaging the cable and cage assembly and forceably rotating both said cable and cage assembly.

5. A conduit cleaner mechanism for alternatively forcibly rotating or freeing a cleaner cable, under operation of a rotary drive member alone, comprising a cable cage having rear and front apertures, a cable normally reeled within the cable cage and extending through the front aperture, a drive member extending through the rear aperture of the cage and mechanically engaged therein and adapted to advance and retract relative to the cage on rotation in opposite directions respectively, the drive member supporting the cage and including terminal means binding the cable to the cage at the extreme front position such that the cable and cage are rotated with the drive member, and means coupled to the drive member for rotating the drive member selectively in either direction, such that the cable is forcibly rotated by use of one direction of rotation, and freed by use of the other.

6. An arrangement for driving a flexible cable for clearing obstructions for a sewer conduit or the like comprising a cage assembly for containing a length of flexible cable to be used in clearing a conduit, a rotatable drive member adapted for insertion within the cage assembly along a central axis thereof, means mounted on the drive member for engaging the cage assembly at a selected extent of insertion of the drive member within the cage assembly, means for rotating the drive member and the cage assembly in order to rotate a flexible cable extending from the cage assembly, and pivotable locking means mounted on the cage assembly and engaging the drive member for locking the drive member to the cage assembly when the drive member is inserted to less than the selected extent.

7. An arrangement for driving a flexible conduit cleaner cable comprising a cage assembly for containing a length of flexible cable to be used in clearing a conduit, a rotatable drive member inserted within and coupled to the cage assembly, the drive member being movable with respect to the cage assembly to provide different extents of insertion therein, means mounted on the drive member for engaging the cage assembly at a selected extent of insertion thereof, and means coupled to said drive member and independent of said cage assembly for rotating the drive member to the selected extent of insertion, thereby to rotate the drive member, cable and cage assembly in locked relation.

8. An arrangement for driving a flexible cable for use in clearing obstructions from a sewer conduit and the like comprising a cage assembly for containing a length of flexible cable and having a neck portion with a central aperture through which the flexible cable may be fed, means for anchoring one end of the flexible cable to the cage assembly, a threaded holder affixed to the cage assembly, a drive member threaded to engage the holder to control the extent of insertion of the drive member within the holder, a locking lever arranged to selectively prevent relative motion between the drive member and the holder, a resilient locking member coupled to the drive member at the terminal portion thereof within the cage assembly and adapted to clamp the flexible cable against the neck portion in a forward position of the drive member within the cage assembly in order to prevent the cable from moving in or out of the cage assembly, and means for rotating the drive member and the attached cage assembly selectively in one direction or the other in order to force the flexible cable to clear an obstruction from a sewer conduit.

9. A drive member for a rotatable conduit cleaner mechanism utilizing a flexible cable and a cage mechanism containing the cable, comprising a drive member including a threaded portion adapted to engage a portion of the cage mechanism and extending therein for advancing the drive member to various selected positions within the cage mechanism, a surface portion of the drive member being configured to receive a locking member affixed to the cage mechanism for preventing relative rotation between the drive member and the cage mechanism, a resilient locking tip coupled to one end of the drive member and adapted to wedge the flexible cable against the particular portion of the cage mechanism at a forward position of the drive member, and a shaft portion to which torque may be applied to rotate the drive member.

10. A drive member in accordance with claim 9 wherein the shaft is engaged to a power actuated driving tool.

11. A drive member in accordance with claim 9 wherein the shaft includes an offset portion together with at least one handle for permitting manual rotation of the drive member.

12. A conduit cleaner mechanism for driving a flexible cable within a conduit comprising a cage assembly adapted to contain a length of flexible cable, a rotatable drive member threaded through a central portion of the cage assembly, means attached to the cage assembly for locking the drive member at selected positions therein, hand power tool means for rotating said drive member

relative to said cage assembly in order to advance and retract the drive member relative to the cage assembly, said drive means including locking tip means engaging the flexible cable substantially fixedly to the cage assembly in the extreme forward position of the drive member within the cage assembly, and a protective housing encompassing a part of the cage assembly, and fixed to the hand power tool means.

13. A conduit cleaner installation enabling an operator to alternatively hand and power feed a flexible cleaner cable comprising a container, a conduit cleaner device disposed within the container and including a power tool, a drive member coupled to the power tool, a cable cage assembly disposed within the container, the cage assembly being coupled to and receiving the drive member and independently rotatable with respect thereto, means for locking the drive member to the cable cage assembly for rotation thereof, flexible cable means wound within and coupled to the cage assembly and extending from the container, the cable means being normally freely movable in and out of the cage assembly, and switch means external to the container and coupled to control the power tool.

14. An arrangement for driving a flexible cable for use in clearing obstructions from a conduit and the like comprising a cage assembly for containing a length of flexible cable and having a neck portion with a central aperture through which the flexible cable may be fed, means for anchoring one end of the flexible cable to the cage assembly, an internally threaded central hub affixed to the cage assembly, a drive member threaded to engage the central hub to vary the extent of insertion of the drive member within the central hub on rotation of the drive member, a locking member coupled to the drive member and adapted to clamp the flexible cable against the neck portion in a forward position of the drive member within the cage assembly in order to prevent the cable from moving in or out of the cage assembly, a hollow tube extending from the neck portion for guiding the flexible cable, an extendible outer tube encompassing the hollow tube for supporting the flexible cable from buckling as it is thrust against an obstruction within the conduit, and means for rotating the drive member selectively in one direction or the other in order to engage and release the flexible cable from the drive member when an obstruction is encountered in the conduit.

15. An arrangement for driving a flexible cable for use in clearing obstructions from a sewer conduit and the like comprising a rotatable assembly for containing a length of flexible cable and having a neck portion with a central aperture through which the flexible cable may be fed, means for anchoring one end of the flexible cable to the assembly, a threaded screw holder affixed centrally within the cage assembly, a drive member threaded to mate with the screw holder and extending toward the central aperture of the assembly, the drive member including a longitudinal slot therein, a locking lever attached to the screw holder and arranged to selectively prevent relative motion between the drive member and the holder, the assembly having at least one opening along its side of sufficient extent to permit access to operate the locking lever, a locking member coupled to the drive member at its forward end and adapted to clamp the flexible cable against the neck portion of the assembly in a forward position of the drive member, and means for rotating the drive member selectively in one direction or the other relative to the assembly.

16. An arrangement for driving a flexible cable for use in clearing obstructions from a sewer conduit and the like comprising a rotatable assembly for containing a length of flexible cable and having a neck portion with a central aperture through which the flexible cable may be fed, means for anchoring one end of the flexible cable to the assembly, a threaded screw holder affixed to the cage assembly, a drive member threaded to engage the screw holder to control the extent of insertion of the drive member within the screw holder, a locking lever attached to the screw holder and arranged to selectively prevent relative motion between the drive member and the holder, the assembly having at least one opening along its side of sufficient extent to permit access to operate the locking lever, a resilient locking member engaging the drive member at its forward end and adapted to clamp the flexible cable against the neck portion of the assembly in a forward position of the drive member, and means for rotating the drive member and the attached assembly selectively in order to rotate the flexible cable to clear an obstruction from a sewer conduit, and a stationary shield member arranged to encompass a substantial portion of the assembly during rotation thereof.

17 An arrangement in accordance with claim 16 further including means for mounting said shield member upon the means for rotating the drive member.

18. A power driven conduit cleaner snake mechanism comprising: a power tool providing a rotatable drive member; a cable cage assembly having a forward open neck portion; a cable anchored and reeled within the cage assembly, and extending through the neck portion of the cage assembly; a drive screw member having a terminal locking tip and mechanically coupled to the drive member of the power tool; a fixed tube mounted about and extending forwardly from the neck portion of the cable cage assembly; a second, movable tube mounted telescopically on the fixed tube for further forward extension; screw holder means mounted within the cable cage assembly for receiving the drive screw in rotatable fashion; and means for selectively locking the drive screw to the screw holder means.

19. An automatic chucking conduit cleaner comprising: a reversible power tool providing a rotatable drive member; a cage assembly having a forward open neck portion and a rear support portion; a cable reeled within the cage assembly and extending through the neck portion of the cage assembly; drive screw means coupled to the rotatable drive member and mounted in the rear support portion of the cage assembly, the drive screw means being adapted to advance or retract relative to the cage assembly upon rotation therein, the drive screw means including a locking tip adapted to wedge the cable fixedly against the open neck portion of the cage assembly, and means for selectively locking the drive screw means to the cage assembly to prevent relative rotation thereof.

20. A power driven plumber snake mechanism for clearing conduits comprising: a power tool including a rotatable drive element; an open front, snake cage assembly having an inner cone and a forward neck portion having a central aperture; a cable snake anchored in the inner cone of the cage assembly and reeled therein, the snake extending through the neck portion of the cage assembly and including a head auger; a first, fixed tube mounted on the forward neck portion of the cage assembly and extending forwardly therefrom; a second, movable tube mounted telescopically on the first fixed tube and arranged to extend further forwardly therefrom; a hub-shaped screw holder member mounted centrally within the inner cone of the snake cage assembly and including a threaded internal aperture along the central axis of the cage assembly, the screw holder including a longitudinal slot extending along the central axis; a drive screw mounted on the drive element of the power tool, the drive screw including an outer thread mating with the threaded aperture of the screw holder, the drive screw including a longitudinal slot along at least a portion of the length thereof, and terminating in a pivot ball on the end opposite the end mounted in the chuck; a resilient, bullet-shaped locking member pivotally mounted on the pivot ball of the drive screw, and having an outer diameter less than the internal diameter of the aperture

in the screw holder, the resilient member conforming generally to the internal configuration of the neck portion of the snake cage assembly; and a locking lever pivotally mounted on the screw holder adjacent the slot therein, the locking lever being movable in one position of operation into engagement with the slot in the drive screw, whereby the cage assembly may selectively be locked to and rotated with the drive screw.

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CHARLES A. WILLMUTH, *Primary Examiner.*

EDWARD L. ROBERTS, JR., *Assistant Examiner.*