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PLUMBING APPARATUS

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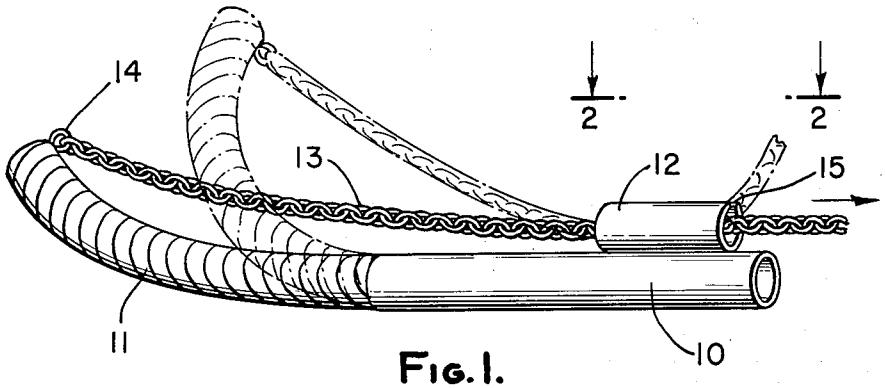


FIG. 1.

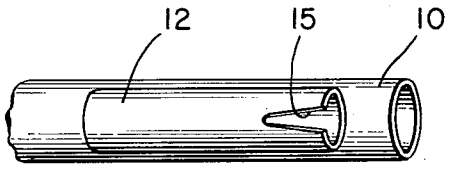


FIG. 2.

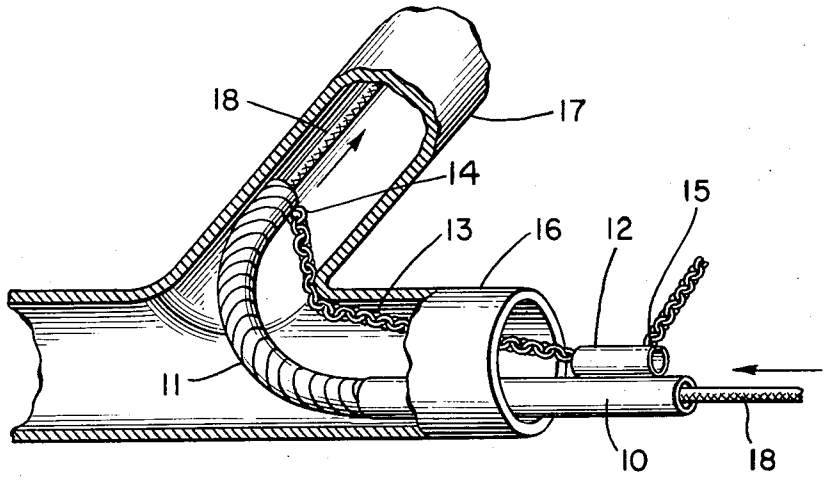


FIG. 3.

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PLUMBING APPARATUS

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This invention relates generally to plumbing apparatus and more particularly to an improved guide structure for cleaning rods to facilitate guiding such rods about pipe bends greater than ninety degrees.

Cleaning of sewers, drains, and other plumbing is generally accomplished by the use of a cleaning rod, commonly referred to as a "snake." This rod is flexible but yet of sufficient longitudinal rigidity to enable it to be urged from one end through plumbing pipes and to follow around corners or other curves in the pipes. In the event that the plumbing system includes a reverse bend or a Y connection, and it is desired to employ the cleaning rod to unclog the reverse bend or one Y portion, some means must be provided for curving the cleaning rod in a direction greater than ninety degrees while it is in the plumbing pipe to get it started in its travel along the reverse bend.

The foregoing problem has been solved to some extent in the prior art by providing a guiding tube for the cleaning rod including a goose-necked portion which actually curves over an arc greater than ninety degrees. However, to be useful in guiding the cleaning rod, the curved tube must be rigid. Therefore, such a curved guide tube can only be used when the reverse bend or Y joint is relatively close to an access opening. If there is any length of straight passage prior to the reverse bend or opening, it is not possible to fit the curved goose-necked portion of the guide tube in the opening.

Bearing the foregoing in mind, it is a primary object of the present invention to provide an improved guide structure which will enable the guiding of a cleaning rod about reverse bends greater than ninety degrees even though such bends may be located a considerable distance from the pipe access opening.

More particularly, it is an object to provide a device of the foregoing type which is easily adjustable for guiding cleaning rods about various different bends over a wide range of different angles.

Other objects of the invention are to provide an improved cleaning rod guide structure which is extremely simple to use, rugged, and may be relatively inexpensively manufactured.

Briefly, these and other objects of the invention are attained by providing a straight guide tube which may be of any desired length. To one end of this guide tube is attached a flexible tube preferably formed by a tightly wound helical spring. The far end of the flexible tube is connected to a pul lline, the other end of which passes adjacent to the main guide tube and can be manually held by an operator. Preferably, a temporary securing means is provided at the initial end of the guide tube for securing intermediate portions of the line. The arrangement is such that the operator may insert the guide tube and flexible tube within a pipe until the flexible tube is adjacent the reverse bend or other connection. At this time, the operator then pulls on the pull line which in turn will cause the end of the flexible tube to curve around into a desired direction corresponding to the

bend in the pipe. The pull line may then be cinched in the temporary securing means and a conventional cleaning rod then passed within the main guide tube and the flexible tube. The flexible line holds the flexible tube in the desiried curved orientation so that the cleaning rod will be properly guided into the reverse bend direction and subsequent cleaning thereof can be achieved.

A better understanding of the invention will be had by referring to a preferred embodiment thereof as illustrated in the accompanying drawings in which:

Figure 1 is an overall perspective view of the plumbing apparatus of this invention;

Figure 2 is an enlarged perspective view of one end portion of the structure of Figure 1 taken in the direction of the arrows 2—2; and,

Figure 3 is an enlarged cutaway perspective view illustrating the operation of the plumbing apparatus of Figure 1 in a reverse bend plumbing pipe structure.

Referring to Figure 1, the apparatus comprises a main guide tube **10** which is straight and may be of any convenient length. Connected to one end of the guide tube **10** is a flexible tube **11**. Preferably, this flexible tube is formed by a tightly wound helical spring structure so that it is normally biased to a straight position axially aligned with the axis of the guide tube **10**, but may be pulled into a curved position. Adjacent the initial or right hand end of the guide tube **10** as shown in Figure 1 is a temporary securing means in the form of a cylinder **12**. The cylinder **12** is arranged to secure an intermediate portion of a pull line such as a chain **13** as shown in Figure 1. The other end of the chain **13** is secured to an eyelet **14** at the free end of the flexible tube **11**. The arrangement is such that by manually pulling the chain **13** through the securing cylinder **12**, the end of the flexible tube **11** may be curved upwardly as indicated in dotted lines. To hold the flexible tube in a desired curved position, any intermediate portion of the chain **13** may be temporarily clamped in the cylinder **12** by urging the chain into a cinching slot **15**.

Referring particularly to the plan view of Figure 2, it will be noted that the slot **15** is V-shaped and formed in the end of the clamping cylinder **11** facing away from the flexible tube.

The operation of the invention will best be understood by now referring to Figure 3 wherein there is shown a main plumbing pipe **16** with a branch pipe **17** defining a reverse bend. In employing a cleaning rod or "snake" such as the snake **18** shown in Figure 3, it would ordinarily not be possible to guide the snake through the pipe **16** and thence into the pipe **17**. By means of the present invention, however, this is readily accomplished by first passing the flexible tube **11** and guide tube **10** into the opening of the pipe **16** until the far or free end of the flexible tube **11** is approximately juxtaposed the point of the reverse bend defined by pipe **17** and pipe **16**. The flexible line **13** may then be manually pulled to raise the free end portion of the flexible tube **11** as a consequence of the connection of the line **13** to this end portion as at **14**.

As shown in Figure 3, this pulling action is continued until the free end of the flexible line is in approximate alignment with the branch pipe **17** at which point the flexible line or chain **13** can be cinched within the V-shaped slot **15** of the temporary securing cylinder **12**. The cleaning rod or snake **18** is then fed through the end of the straight tube **10** and will be guided by the flexible tube **11** about a curved path corresponding to the angulated connection of the branch pipe **17** until the end of the cleaning rod or snake **18** passes out the end of the flexible tube. During the cleaning of the branch pipe **17** by the cleaning rod, the guide tube **10** and flex-

ible tube **11** may be retained in place. Alternatively, the guide tube **10** and flexible tube **11** may be removed by sliding these members off from the exposed end of the cleaning rod **18** provided that further extension of the cleaning rod into the branch pipe **17** is not necessary. There is, of course, no problem in retracting the cleaning rod from the branch pipe **17**.

In using the guiding structure as desribed above, it will be evident that the operator must know when the flexible tube **11** has been curved around sufficiently to insure that the cleaning rod subsequently passed therethrough will pass out the end of the flexible tube in a direction substantially aligned with the branch pipe **17**. While the degree of arcing of the flexible tube **11** can be generally determined through experience after using the device several times, it is also possible for the operator to observe the length of the flexible line or chain **13** which is pulled through the clamping cylinder **12** since the length of line so pulled will be an indication of how much the end of the flexible tube **11** has been flexed. To facilitate the measurement of the length of the flexible line pulled through the clamping cylinder **12**, the number of links of the chain may be counted. Alternatively, of course, small markers in the form of beads or simple marks could be provided along the flexible line at fixed spaced distances so that by simply counting these markers, the operator is apprised of the approximate degree through which the flexible tubing has been pulled from an initially straight or horizontal position.

From the foregoing description it will be evident that the present invention has provided a greatly improved guide structure for facilitating the cleaning of plumbing pipes wherein it is desired to gain access to reverse bends or Y joints which exceed ninety degrees. It will also be appreciated that while the rigid guide tube **10** is shown as of substantially the same length as the flexible tube **11**, the guide tube **10** may be of increased length in the event that the initial opening in the pipe **16**, for example, were further located from the point where the branch pipe **17** connects. Since the flexible tube portion **11** is initially aligned with guide tube **10**, the overall dimensions of the structure are limited substantially only to the outside diameter of the guide tube **10** or flexible tube **11** and the additional small cross dimension of the flexible line or chain **13**.

Minor modifications that fall within the scope and spirit of the present invention will readily occur to those skilled in the art. The cleaning rod guide structure is, therefore, not to be thought of as limited to the specific embodiment set forth for illustrative purposes only.

What is claimed is:

1. For use in a plumbing pipe structure including a pipe bend greater than 90 degrees preceded by an additional pipe portion so that access to said bend is only through said additional pipe portion, a plumbing apparatus for guiding a pipe cleaning rod through said additional pipe portion and around siad pipe bend, comprising, in combination: a guide tube; a flexible tube connected to one end of said guide tube, said flexible tube being formed of resilient material having spring characteristics normally biasing said flexible tube to a straight position; a temporary securing means secured adjacent to the other end of said guide tube; and a flexible pull line having one end secured to the free end portion of said flexible tube, the other end of said flexible pull line passing through said temporary securing means and being adapted to have intermediate portions temporarily secured to said securing means, whereby said flexible tube is normally aligned with said guide tube for insertion in said additional pipe section and when said free end of said flexible tube is adjacent to said pipe bend, said line may be pulled to curve said flexible tube against its bias into a direction to align its free end in the new direction defined by said pipe bend, said pull line then being securable in said securing means, said pipe cleaning rod thereby being guided in said new direction upon urging of said rod through said guide tube and flexible tube.

2. An apparatus according to claim 1, in which said flexible tube is defined by a tightly wound helical spring coil.

3. An apparatus according to claim 1, in which said temporary securing means comprises a cylinder parallel to and in tangential engagement with said guide tube, said cylinder having a V-shaped slot cut in the upper end of said cylinder facing away from said flexible tube whereby said flexible line can be passed through said cylinder and cinched within said slot at any desired intermediate portion.

4. An apparatus according to claim 1, in which said flexible line includes means uniformly spaced therealong to provide an indication of the length of portions of said line.

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