

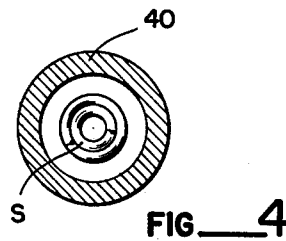
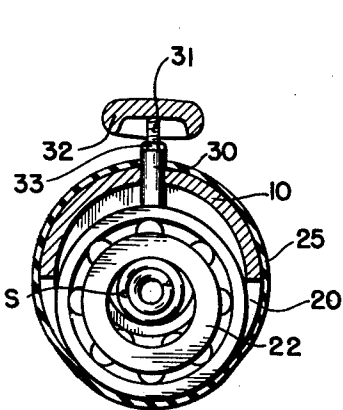
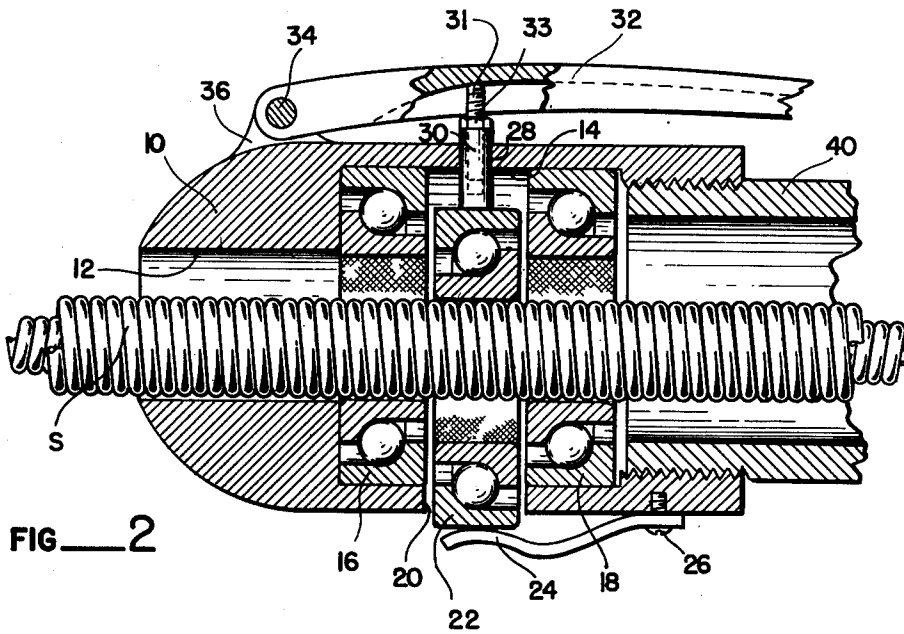
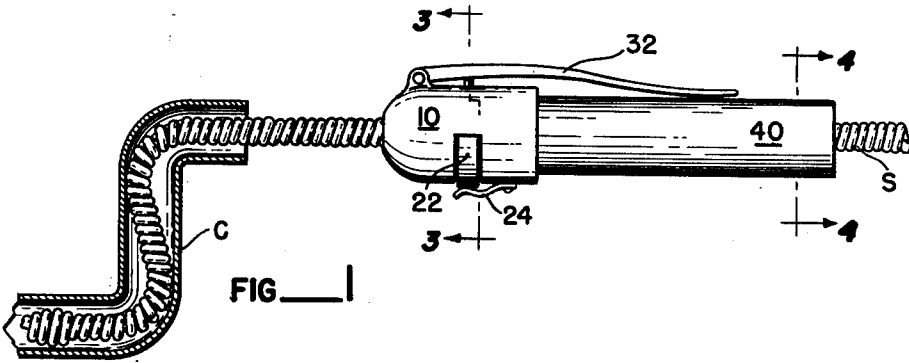
June 17, 1952

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2,600,707

FLEXIBLE ROTARY REAMING APPARATUS

Filed April 15, 1949



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2,600,707

FLEXIBLE ROTARY REAMING APPARATUS

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Application April 15, 1949, Serial No. 87,621

5 Claims. (Cl. 15—104.3)

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This invention relates to improvements in flexible rotary reaming apparatus and, more particularly, is the provision of a chucking mechanism whereby a rotary snake or the like can be gripped and moved longitudinally while the snake is rotated.

In cleaning sewer pipe and other conduits, and in wiring building structures, the workmen often encounter considerable difficulty in forcing their way through the conduits with long flexible snakes. In similar respect, difficulties are encountered in withdrawing the snakes due to binding at the bends of the conduits or because of obstructions, rough projections or the like. The problems are particularly aggravated where the snake is a rotary element that is constantly turned because in this instance the workmen finds it difficult, and sometimes injurious to their hands, to grasp the rotating snake to pull or push it. The basis of the problem appears to lie in the fact that the snakes are small size, become slippery, and are otherwise not adapted to be manually grasped. In addition, even if they may be grasped by hand, the fact that they are usually rotating, means that the workman must be constantly re-grasping or regripping the snake as it turns in his hand.

Having in mind the conditions of operation involved and the difficulties previously encountered, it is a prime object of this invention to provide a chuck for gripping rotary snakes to facilitate the application of manual force or produce longitudinal movement of the snake in either direction while the snake is rotating.

Among other and important objects of the invention has been the provision of a device of the type indicated which is simple to construct, easy to use, so adapted that it is easily disassembled for cleaning and overhaul, can be assembled and disassembled without the use of tools, will not injure the snake during gripping, will not impair the operation of the snake even through substantial forces are being applied to pull the snake or push it relative the conduit, and which will instantly release a snake for altering the location of the chuck on the snake or relieve it from endwise tension or compression.

These and other objects of the invention will be apparent upon reference to the following specification and the accompanying drawings, in which:

Figure 1 is a view in side elevation of my snake-gripping device illustrating the apparatus as it appears in use in cleaning a conduit with the latter shown in section for convenience of illustration;

Figure 2 is an enlarged longitudinal sectional view of a forward portion of the snake-gripping means illustrating the construction and operation of the device;

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Figure 3 is a vertical sectional view taken on line 3—3 of Figure 1 showing a slight modification; and

Figure 4 is a vertical sectional view taken through the snake and handle on line 4—4 of Figure 1.

In overcoming the defects of the prior art and in carrying out the objects of my invention, I provide a chuck that is designed to permit the application of manual force to a flexible and rotary snake longitudinal of its axis. The chuck comprises a casing of a size adapted to be handled manually with ease and has a through bore of a size to receive the rotary snake. Within the casing is a pair of spaced apart free rotating collars and interposed between these collars is a third free rotating collar, all of which encircle a snake inserted in the housing. The first pair of collars is not normally displaceable laterally of the casing, but the interposed collar can be displaced laterally whereupon a rolling, gripping action is obtained on the snake between and among the collars. Means, including a presser element, is provided on the casing to facilitate the lateral movement of the interposed collar by manual pressure. In a preferred form of the invention, the collars take the form of double race roller or ball bearing elements of standard construction.

More specifically, referring particularly to Figure 2, the invention includes a casing 10 having an axial passage 12 of a size to loosely accommodate a snake S which is shown to be of the coiled wire variety. Interiorly, casing 10 is counterbored to form an enlarged cylindrical chamber 14 of a size to closely receive a pair of double race, free-rolling bearing elements or collars, 16 and 18, which may be introduced through the side-wall slot 20 and be disposed one to each side thereof.

A third free-rolling bearing element or collar, 22, is also introduced into the chamber through the slot 20 to be interposed between bearing elements 16 and 18. Element 22 is retained in the casing by the spring blade 24 that is mounted on screw 26 about which it may be swung to relieve the obstruction of slot 20 as when the bearings are being placed or removed. The collars 16, 18 and 22 may be roughened or knurled on their inner faces to increase their frictional engagement with the snake that they are caused to grip. A resilient rubber sleeve 25 is shown in Figure 3 in lieu of blade 24 to retain collar 22 in place and to close opening 20 of the casing.

Opposite slot 20 the casing is pierced by opening 28 to allow the introduction into the chamber 14 of the extensible presser pin 30 that is actuated by handle 32. The latter handle is mounted to swing on pin 34 that is supported by upstanding ears 36 that rise above the casing 10. A

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preferable presser pin 30 takes the form of a sleeve that is internally threaded to receive bolt 31 which permits adjustment of the length of the pin 30 and the distance that it displaces collar 22 when the handle 32 is pressed to casing 10. Lock nut 33 secures sleeve 30 and bolt 31 in adjusted length.

The rear end of casing 10 is interiorly threaded to receive the forward end of tube 40, which makes it easier for a workman to grasp and handle the tool.

In operation it is customary for snakes S to be rotated with considerable force by mechanical means (not shown), such as geared electric motors or comparable equipment. At the same time that the snake is rotated, it is fed in or pulled out of the conduit to accomplish a cleaning or reaming of the conduit or to remove it after such an operation has been completed. It is with respect to the latter longitudinal movement of the snake while it is rotating that my invention particularly applies. To accomplish this, the operator introduces the snake through the extension 40 and the central openings of collars 16, 18 and 22 and out the bore 12. The snake is then fed into the conduit C which, for example, may be a drain conduit from a sink or the like. The snake is caused to rotate and is pressed into the conduit at the same time. When the going is easy, the introduction of the snake can often be accomplished merely by pressing it forward but when obstructions are encountered, my chuck becomes particularly useful. The tool is grasped and the handle pressed toward the casing to cause the horn 30 to bear upon collar 22 and displace it laterally of the collars 16 and 18. This results in a three-point gripping action upon the snake with one side of the snake being borne upon at two spaced-apart points and the other side at a single point between the other two. Since the collars are free to rotate, no hindrance to the snake's rotation is caused but at the same time, the snake is tightly chucked by the tool so that the operator can exert pressure forward on the snake. In the case of roller or ball bearing collars, contact with snake is made by the inner race and it turns freely with snake while gripping is maintained with the rollers or balls reducing friction in the operation.

As the snake enters the conduit C and the tool moves close to the end of the conduit, the workman merely releases the grip on the snake and withdraws his tool along the snake to a point where he can take a new purchase for further forward movement. Such continues until the cleaning operation is completed.

When it is desired to pull on the snake, the foregoing described operation is repeated in reverse.

To disassemble the tool for cleaning or repair or the replacement of parts, it is first removed from the snake. The blade 24 is swung out of the way, whereupon collar or bearing 22 will come out of the casing through slot 20. Then one or the other of the collars or bearings 16 or 18 is moved longitudinally of the chamber 14 to alignment with slot 20 and similarly removed. The same is done with the other collar. It will be noted that such assembly can be performed without the use of any tools.

It will be seen that this chucking device is simple of construction, may be easily serviced, cleaned or repaired, and can be formed lightly and yet strong and durable for the hard use to which it may be put. Obvious modifications and

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changes in the arrangements of parts are contemplated within the spirit and scope of the subjoined claims.

What I claim and desire to secure by Letters Patent is:

1. A movable chuck for gripping rotary snakes to facilitate the application of force longitudinal of the snake in either direction while the snake is rotating, comprising: a casing, of such size, weight and shape as to be conveniently held and manipulated in the hands of an operator, having a longitudinal bore from end-to-end, a pair of freely rotating collars mounted in said bore, with their axes in substantial alignment with the axis of said casing, a third freely rotating collar interposed between said pair of collars with said pair of collars positioned close to said third collar, said casing being adapted to permit lateral movement of said third collar relative to said pair of collars, and presser means operable upon said third collar to laterally shift the latter whereby a gripping action is imparted upon a snake passing through said collars while permitting the snake to rotate within said casing.

2. The device according to claim 1 in which the freely rolling collars are bearing elements, having double races and a plurality of rolling spacers interposed therebetween.

3. The device according to claim 1 in which the presser means to laterally shift the interposed collar comprises a pivoted hand lever and a presser pin actuated thereby and passing into the casing to bear upon the interposed collar.

4. The structure according to claim 1 including resilient means operable upon the third collar to bias the same to a non-gripping relation relative to said pair of collars.

5. A movable chuck for gripping rotary, flexible snakes to facilitate the application of force longitudinal of the snake in either direction while the snake is rotating and passing through conduits and the like, comprising: a casing, of such size, weight and shape as to be conveniently held in the hands, having a longitudinal bore from end-to-end, said casing having a side slot giving access to the interior thereof between its ends, a pair of freely rotating collars mounted in said casing laterally immovable and positioned one on each side of said slot with their axes in substantial alignment with the axis of said casing, a third freely rotating collar introduced into said casing through said slot and interposed between said pair of collars, said third collar being laterally movable relative to said first pair of collars, resilient means to retain said third collar from displacement through said slot, and manually operable presser means upon said third collar to laterally shift the latter whereby a gripping action is imparted upon a snake passing through said collars while permitting the snake to rotate within said casing.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
599,089	Wrigley	Feb. 15, 1898
788,593	Olcott	May 2, 1905
1,162,125	Bassett	Nov. 30, 1915
1,880,431	Goodall	Oct. 4, 1932
1,888,269	Herst	Nov. 22, 1932
2,033,670	Auer	Mar. 10, 1936
2,044,848	Hermanson	June 23, 1936