

Aug. 11, 1942.

A. A. O'LEARY

2,292,713

SHREDDER HEAD FOR SEWER CLEANERS

Filed Aug. 15, 1938

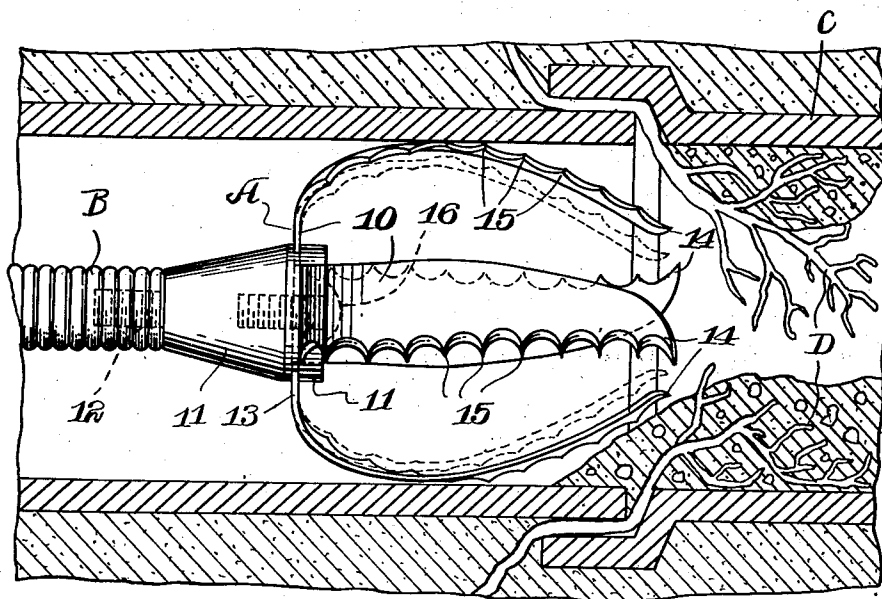


Fig. 1

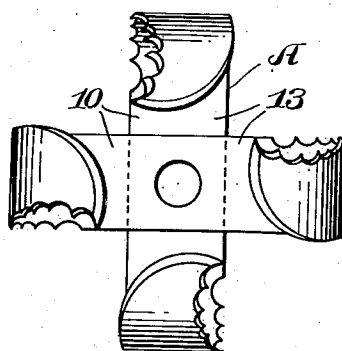


Fig. 2

Inventor
Andrew A. O'Leary

By Howard F. Fisher
Attorney

UNITED STATES PATENT OFFICE

2,292,713

SHREDDER HEAD FOR SEWER CLEANERS

Andrew A. O'Leary, St. Paul, Minn.

Application August 15, 1938, Serial No. 224,926

1 Claim. (Cl. 15—104.09)

My invention relates to an improvement in shredder heads for sewer cleaners, wherein it is desired to provide a shredder head capable of cutting through an obstruction of virtually any type within a pipe.

Since the idea of cleaning sewer pipes by rotating a cutter of some sort through the same was developed, various attempts have been made to provide cutter heads which will thoroughly clean or remove an obstruction in the pipe without breaking. Because of the fact that a great deal of sand and other abrasive material is often found in sewers and pipes to be cleaned, it is extremely difficult to maintain a cutting edge on most of these cutters. It is also found that where obstructions virtually close the pipe, it is difficult to cut away the obstruction to the full size of the pipe without injury to the cutter. It is further a known fact that the roots or other material obstructing the pipe is apt to catch one blade of a cutter having a plurality of blades and to effectively stop rotation of the cutter, thus either injuring the cutter itself or the drive cable.

It is a purpose of the present invention to obviate most of the foregoing difficulties by properly shaping my cutter blade and by constructing the same in a manner to readily withstand the strain placed upon the same during the cutting action. My cutter is formed with spring steel blades which are arcuated in shape and which are bent inwardly at the front end of the same so as to guide the cutter into a small opening through the pipe. Accordingly, by means of these arcuated blades, the cutter acts to ream out any small opening through the pipe and to act somewhat as a reamer gradually cutting or shredding the particles of material formed within the pipe away from the walls of the pipe. These cut or shredded portions can ordinarily be flushed down the sewer by means of a small flow of water through the sewer during the cleaning operation.

It is a feature of my invention to provide a cutter having blades formed of resilient material such as spring steel so that the knife will conform to the inner size and shape of the pipe in which it is operating. The portion of largest diameter of the cutter may engage the walls of the pipe under a slight spring tension during operation thereof, but the cleaner will readily pass through slightly smaller portions of the pipe due to the spring formation of the same.

It is a purpose of my invention to provide a cutter or shredder head having four or more cutting blades thereupon. It has been found that where only two cutter blades are used, the cutter

has an opportunity to move a considerable distance between the time one blade rotates past a certain point and then the next. This permits the blades to catch much more easily than where a minimum of four blades are provided, and the cutting action may be maintained much more uniform and more steady. Furthermore, the pressure on the blades is apparently more uniform where a minimum of four blades is used for in actual tests I have shown that a two bladed cutter will become stalled or stopped upon striking an obstruction, while a four bladed cutter will operate steadily through the obstruction without injury to the blades.

It is a feature of my invention to provide a shredder head with a series of blades having teeth thereupon which act to shred or slice a small amount of the obstructing material from the mass of the obstruction at a time. Thus my cutter slowly but steadily cuts its way through the obstruction by shredding the same into small bits which may be readily flushed down the sewer.

These and other objects and novel features of my invention will be more clearly and fully set forth in the following specification and claim.

In the drawing forming a part of my specification:

Figure 1 is a side elevation view of my cutter in place within a sewer pipe.

Figure 2 is a front elevation view of my cutter.

My cutter A is designed for attachment to a flexible shaft B or the like and is used for cleaning or cutting obstructions from within sewer pipes such as C.

The cutter or shredder head A comprises a pair of strips 10 of spring steel or the like extending at right angles one to another and being secured in this right angular relation by means of a clamping member 11. The clamping members 11 hold the strips 10 at right angles and are attached by means of the threaded shank 12 to the flexible cable B. The clamping members are held together by means of a bolt 16. The detail manner in which the clamp operates is not important in the present patent, and any means may be employed for securing the blades to the cable B and securing them in proper relationship. The clamping means 11 is, however, advantageous in that the blades may be readily removed for sharpening or replacement.

The blades 10 are provided with a central flat portion 13. These portions 13 are the portions which are clamped together by means of the clamping member 11. On either side of the flat central portion 13, the blades 10 bow outwardly

and forwardly so that the portion of largest diameter of the strips is at a point intermediate the flat center portion 13 of the strips and the extreme ends of the same.

The extreme ends of the blades are not spaced a great distance apart and because of the relatively small diameter between the tips 14 of the strips forming the blades, the cutter may be inserted in a relatively small opening and cuts along a tapered path back to the portion of largest diameter of the blades. In other words, because of the fact that the strips 10 are formed of spring steel or the like, and because of the fact that the tips 14 of the strips are relatively closer together and may spring inwardly if necessary, the entire portion of the blade from the extreme tips 14 thereof to portion of largest diameter of the blades may be used in shredding the material gradually from the obstruction indicated at D in Figure 1 of the drawing. The bow shape of the blade thus forms first a small hole through the obstruction and then the length of the blade acts to ream the hole out to larger size.

In forcing the cutter head A through a pipe such as C it is found that when a minimum of four blades are used on the cutter, the blades strike the obstruction even though the same may be located on one side of the pipe, twice as often as though only two cutter blades were provided. Thus the applicant's cutter head does not move forwardly so far between successive cuts by the blades, and therefore the blades are not likely to become wedged against the obstruction to stop rotation of the cutter head.

On each of the blades which extend from the flattened portion 13 to the tips 14, I provide a series of teeth 15 which assist in the slicing or shredding action of the cutter head. These teeth act to cut small chips from the material forming the obstruction and these chips may be readily flushed away through the pipe.

In accordance with the patent statutes, I have described the principles of construction of my cutter head; and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that this is only illustrative of a means of carrying out my invention and that obvious changes may be made within the scope of the following claim without departing from the spirit of my invention.

I claim:

A cutter head for sewer cleaners comprising a pair of resilient strips clamped at substantially right angles having a pair of ends free to flex in a radial direction, each strip including a central flat clamping portion designed to extend radially, an outwardly and forwardly curved portion at each end of each central flat clamping portion, said curved portion extending to the point of greatest diameter of the head, a gradually curved portion connected to each first named curved portion converging said strips together to bring the ends of the strips more closely adjacent one another, the said point of greatest diameter being nearer said central clamping portion than to said ends, and arcuated teeth on said strips.

ANDREW A. O'LEARY.