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PIPE CLEANING TOOL

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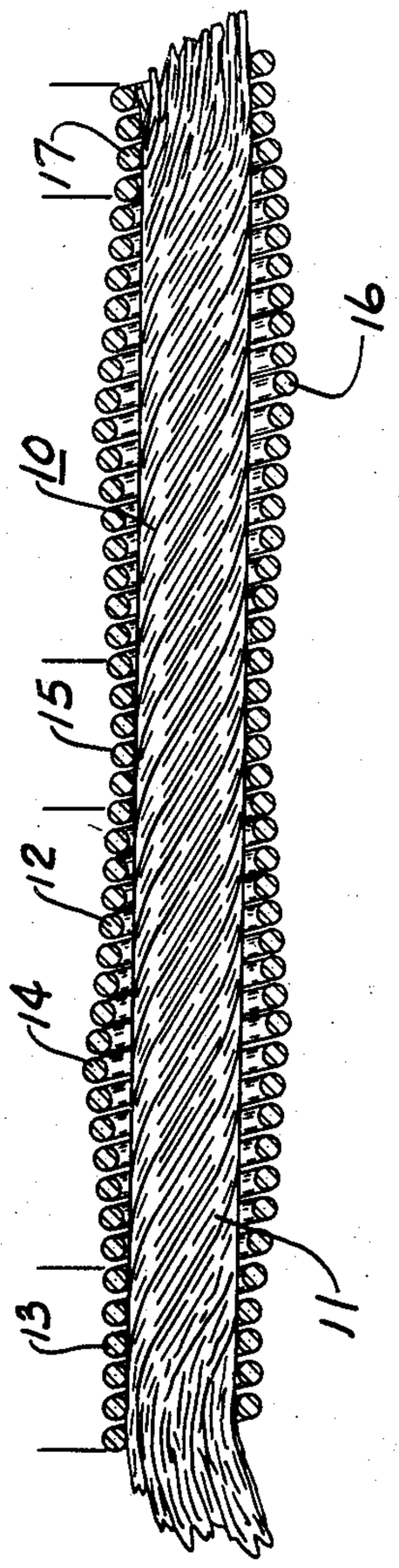

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PIPE CLEANING TOOL

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3 Claims. (Cl. 64—2)

This invention is an improvement in flexible fishing lines for cleaning pipes and sewers.

The flexible line comprising this invention is an improvement over the Pipe Cleaning Tool disclosed in Patent No. 2,244,735 of June 10, 1941.

The flexible snake has a longitudinal core of twisted multistrand cable with an outer sheath of spring steel wire helically wound with spaced turns in continuous gripping contact on the core having sufficient gripping force to prevent longitudinal movement between the sheath and core to keep them from breaking apart under tensional load. This flexible fishing line presents some difficulty in negotiating sharp turns and sharp return bends, particularly when the size of the core and sheath are increased for heavier work. The small sizes sometimes take a permanent set or become kinked when subjected to a hard pull while extended around a sharp turn. The larger sizes are limited to the degree of sharpness in the turn and one or possibly two turns may slip due to a heavy pull when disposed in a sharp turn. This slip in the armor creates a kink that gives trouble thereafter.

These difficulties have been overcome in making these snakes more flexible by having alternate tight and loose sheath sections which permit the flexible cable to negotiate sharper turns. These flexible fishing lines will more readily slip around sharper turns by having their helical sheaths wound in alternate zones where the spaced helical wire grips the cable core for a short distance and then in the next zone the spaced helical wire is loose on the cable core for a short distance which zones are alternately repeated along the entire length of the line. This allows the cable more freedom in the zones where the sheath is loose which nullifies the stiffer zones where the sheath grips the cable. The length of the loose zones may be equal to or greater than the zones in which the sheath grips the core.

The movement of the helical sheath in the zones where it is loose aids the pulling of the line from a tight sharp bend as the loose helical turns tend to bunch up and spring the line free of the corner without creating a kink in the cable.

Other objects and advantages appear hereinafter in the following description and claims.

The accompanying drawing shows for the purpose of exemplification without limiting the invention or claims thereto certain practical embodiments illustrating the principles of this invention which is a view of a sheathed cable having the sheath in section.

Referring to the drawing the flexible member or line **10** is made up of the multistrand cable core **11** and a helical sheath **12** of coiled spring tempered wire or its equivalent that is wound thereover. The longitudinal sections **13**, **15** and **17** of this flexible member represents the zones where the spaced turns of the sheath are in frictional engagement with the cable core. This shield is wound with spaced turns in continuous gripping contact on the core **11** for the length of each of the zones

13, **15** and **17**. These gripping zones provide enough force to prevent any longitudinal movement of the sheath along the core. The intermediate or alternate zones **14** and **16** are also formed by spaced helical winding of the sheath wire but in these zones the sheath wire does not grip the cable core. It may touch the core or even be spaced slightly from the core but each of these alternate loose sections that are formed along the full length of the cable permit greater flexibility of the line when negotiating sharp bends. Tools of this character may be as long as four, six, twelve or more feet and the first and last zones are made to be the sheath clamping zones such as **13**.

The sheath clamping zones **13**, **15** and **17** may each be as long as five-eighths of an inch when the core **11** is approximately three thirty-seconds of an inch and the corresponding alternate loose zones would be approximately two inches and the total length may be any desired length such as four or forty feet. The sheath wire is approximately .08 to .095 in diameter and the finished tool would be considered a one-fourth inch tool.

If the core **11** is made of one-eighth diameter cable and the wire sheath is made of .105 to .120 diameter wire the spacing is greater between the turns and the clamping zones will be approximately eight to nine-tenths inch long and the loose zones two and one-half inches long.

For a cable core of three-sixteenths inch in diameter the wire sheath would be wound of .125 to .135 diameter wire and the clamping zones **13** would be approximately one inch long with the loose zones **14** approximately three inches long. This would produce a tool known as a half inch line.

If the cable core was one-quarter inch in diameter and the wire sheath wound with .205 to .250 diameter wire the clamping zones **13** would be approximately one and one-third inches long as the loose zones would be approximately four inches long. This would be used as a three-quarter inch line.

These dimensions will vary somewhat as the wire diameters vary and also due to the temper characteristics of the wire. Some shipments vary materially. If the wire is stiffer and harder it should of course be wound with greater spacing than when softer. Sometimes the cable core is looser which requires a tighter gripping for the clamping zones. In any event the sheath must be wound with a space between each turn and by applying alternate gripping and loose zones which results in a more flexible line without detriment to the pulling strength of the line.

I claim:

1. A flexible line having a core formed of twisted multiple strand cable and having an outer sheath consisting of spring steel wire wound helically with spaced turns comprising alternate clamping and loose sheath zones extending longitudinally of the line, there being a plurality of each form of zone, the sheath frictionally gripping the core continuously for the length of each clamping zone to prevent relative longitudinal movement between the cable and the sheath, and the sheath being loose on the core for the length of each loose zone.

2. The structure of claim 1 characterized in that the length of the clamping zone to the length of the loose zone is in the approximate proportion of 1 to 3.

3. Structure of claim 1 characterized in that the first and last zones of the line are clamping zones.

References Cited in the file of this patent

UNITED STATES PATENTS

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