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[54] **PIPELINE PARAFFIN SCRAPER**

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[51] **Int. Cl.**[2] **B08B 9/04**

[58] **Field of Search** ..... 15/104.06 R, 104.06 A, 15/3.5, 3.51; 166/192

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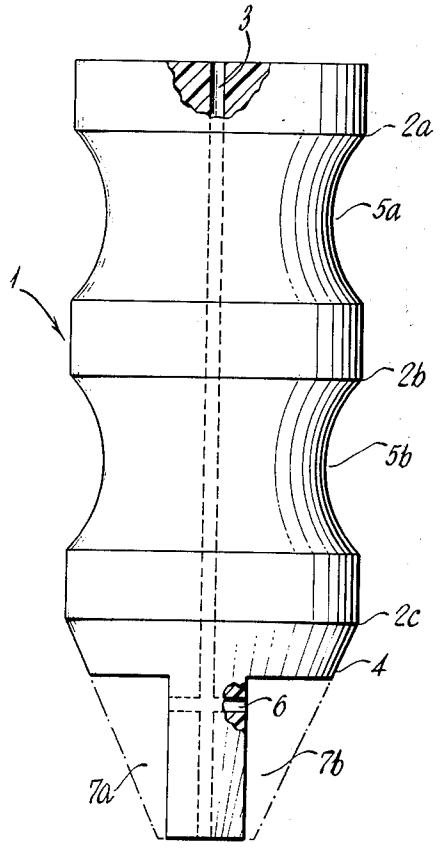
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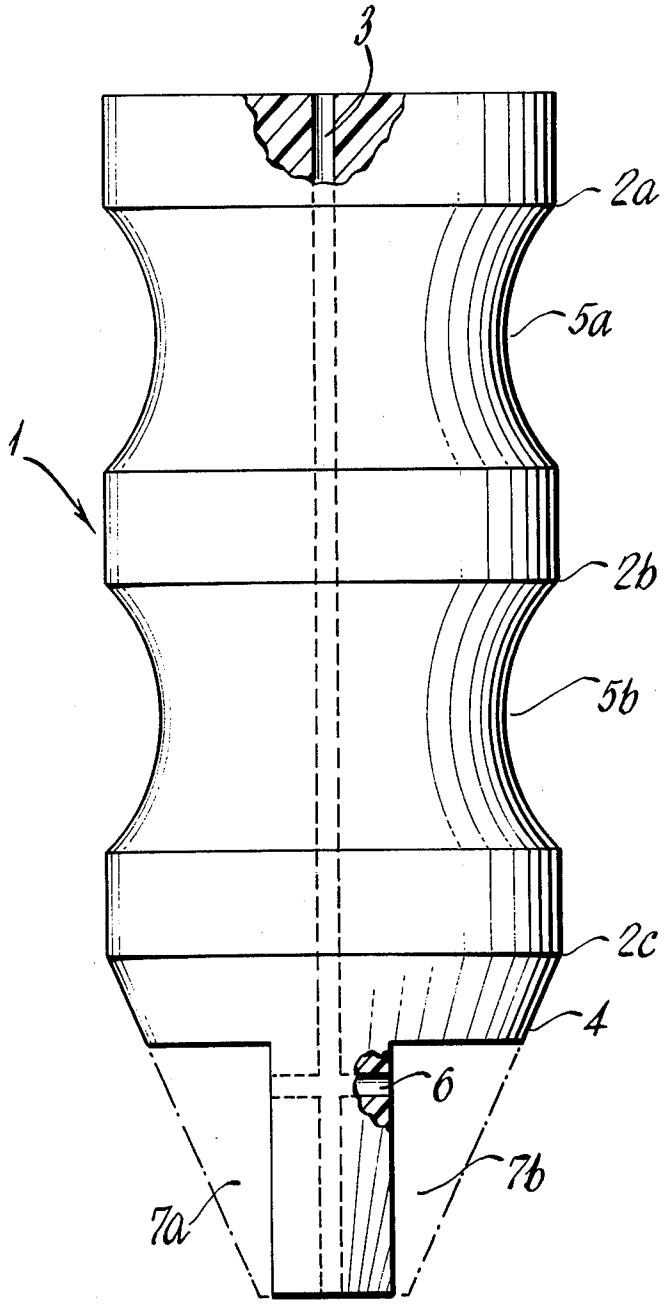
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[57] **ABSTRACT**

A paraffin scraper for pipelines. It is the type commonly called a pig, which is driven through the pipeline by fluid pressure in the pipeline. It has a solid plastic cylindrical shape with a number of annular recesses. In addition, there is a small-diameter axial bore extending through the whole length of the body to create a jet-fluid stream at the front during scraping action.

2 Claims, 1 Drawing Figure




3
2a
5a
1
2b
5b
2c
4
6
7b
7a

PIPELINE PARAFFIN SCRAPER

BACKGROUND OF THE INVENTION

The invention relates to a pig, especially for cleaning lines, such as pipelines, transfer and production lines, hereinafter referred to as "lines."

Various types of pigs used for the removal of paraffin deposits, or the like, are known. Pigs consisting, for example, of metal or rubber discs and comprising springs and screws which, in turn, remove said deposits, are used for different cleaning jobs. Pigs are of differing configuration which will depend on the kind of line to be cleaned, be they positioned either horizontally or vertically. In the lines, especially positioned horizontally, there are pigs being used which are passed onward by means of pressure of the medium to be transferred. The pigs are mostly put into special pig locks from where they reach the lines to be treated. In not always perfectly laid or accurately welded lines, the aforementioned pigs may only be used restrictively. In order to be able to pass the unsmooth sections of the interior wall of the line, the pigs in use are made of a material, i.e., paraffin, which, to a certain extent, adapts itself to the local data. Due to the unsmooth sections of the interior walls of the lines, these paraffin pigs are often torn a little or burst and are, therefore, often untimely destroyed. A further disadvantage of said paraffin pigs is that they may be used only once so that working with such a pig, especially in lines with a strong paraffin accumulation, would mean a considerable expense factor.

Consequently, it is an object of this invention to create a pig especially for cleaning lines such as pipelines, transfer and production lines, having a good adaptability to the unsmooth interior of the lines and, beyond that, permitting a frequent utilization thereof.

Solving the set problem, a pig of the aforementioned kind was created, consisting of an elastic plastics solid material being shaped so as to form recesses at the periphery thereof to provide scraping edges.

This pig configuration has the advantage over the paraffin pig that there is no longer the danger of it being torn when driven onto an obstacle, as the pig of the invention can be passed by said obstacle. Even after a long-term employment of the pig of the invention, there are only minor cut-ins or scratches to be observed on said pig body which will gradually close so that there will be a continuous good cleaning effect.

SUMMARY OF THE INVENTION

Briefly, the invention concerns a pipeline paraffin scraper which comprises in combination a solid generally cylindrical body of plastic material and a plurality of annular recesses between the ends of said body to provide scraping edges thereon.

Again briefly, this invention concerns a paraffin scraper which comprises in combination a solid generally cylindrical body of plastic material. The said body has a pair of arcuate annular recesses that are spaced axially apart and from the ends of said body leaving maximum diameter smooth surface areas therebetween. It also comprises a frusto conical front end on said body which has a pair of parallel walled recesses therein. Said parallel walls are parallel to and symmetrically located relative to the axis of said body. The said parallel walled recesses extend diametrically to the outside surface of said front end and form transverse flat walls near the base of said frusto conical front end. It also comprises an axially located small-diameter passage extending through said body including said front end for permitting a jet of pipeline fluid to precede the scraper as it moves through the pipeline, and a transverse small-diameter passage interconnecting said parallel walled recesses and communicating with said axial passage and having the openings thereof at said parallel walls located near said base of said front end.

BRIEF DESCRIPTION OF THE DRAWING

The foregoing and other objects and benefits of the invention will be more fully set forth below in connection with the best mode contemplated by the inventors of carrying out the invention, and in connection with which there are illustrations provided in the drawing wherein:

The FIGURE of drawing is a side elevation, partly broken away in cross-section, showing a scraper according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the FIGURE of drawing, it should be noted that the pig **1** consists of an elastic plastics solid material body. It has annular recesses **5***a* and **5***b* that are disposed axially spaced in series at its cylindrical periphery. There is a frusto conical-shaped forward end **4**, and scraping edges **2***a* and **2***b* are formed by the recesses **5***a* and **5***b*, as well as the conical forward end **4**. A throughbore **3** extends coaxially through the body of the pig **1**. The forward end **4** is provided with recesses **7***a* and **7***b* that are disposed parallel to each other on both sides of the axial center. A transverse bore **6** crosses through, and connects with, the bore **3** which extends through the flattened forward end **4**.

In connection with the foregoing structure it may be noted that the pig has a beneficial feature of an axial through-bore. One advantage of this feature is that it permits the passage of a search pig toward the pig of this invention if the latter should become stuck, e.g., on account of narrowing of the line. Such action is feasible because the axial bore of the pig lets the pipeline fluid still flow sufficiently. In addition, the axial bore causes a jet effect in front of the pig which keeps the scraped paraffin in suspension.

Another feature of this invention concerns the recesses that are provided at the forward end of the pig. These recesses are disposed parallel to each other on both sides of, and spaced from, the axial center of said pig. The parallel surfaces of said recesses communicate with each other via a transverse bore which, in turn, communicates with the through-bore.

On account of its flattened forward end, the pig may easily be taken out of a pig lock, and the pipeline fluid penetrating through the transverse bore will take care that the scraped paraffin does not continue to accumulate on said recesses. The ratio of length-to-diameter of the pig is chosen such that the pig does not tilt into an exit or slide valve, but passes all lines well.

It was found that the use of the pig of the invention in field operation proved to be especially satisfactory when being manufactured from polyvinyl acetate.

A preferred polyvinyl acetate material is characterized by a density of **1.25** grams per cubic centimeter (DIN **53550**), a degree of Shore hardness of about **95**

(DIN 53505), a tensile strength of 500 kilopounds per square centimeter (DIN 53504), tearing strength of 90 kilopounds per square centimeter (DIN 53515), an abrasion of 60 cubic millimeters (DIN 53516), and a residual stress of 20 percent (DIN 53517).

While the invention has been described above in considerable detail and in accordance with the applicable statutes, this is not to be taken as in any way limiting the invention but merely as being descriptive thereof.

We claim:

1. A pipeline paraffin scraper, comprising in combination

a solid generally cylindrical body of plastic material,

said body having a pair of arcuate annular recesses spaced axially apart and from the ends of said body leaving maximum diameter smooth surface areas therebetween,

a frusto conical front end on said body having a pair of parallel walled recesses therein,

said parallel walls being parallel to and symmetrically located relative to the axis of said body,

said parallel walled recesses extending diametrically to the outside surface of said front end and forming transverse flat walls near the base of said frusto conical front end,

an axially located small-diameter passage extending through said body including said front end for permitting a jet of pipeline fluid to precede the scraper as it moves through the pipeline, and

a transverse small-diameter passage interconnecting said parallel walled recesses and communicating with said axial passage and having the openings thereof at said parallel walls located near said base of said front end.

2. Pipeline paraffin scraper, comprising in combination,

a solid generally cylindrical body of plastic material,

a plurality of annular recesses between the ends of said body to provide scraping edges thereon,

a frusto conical end on said body for acting as the front in a scraping operation,

an axially located small-diameter passage through said body including said frusto conical end for permitting a jet of pipeline fluid to precede the scraper as it moves through the pipeline,

a pair of recesses in said frusto conical end disposed parallel to each other on both sides of and spaced from the axial center of said scraper, and

a transverse bore communicating with said parallel recesses and with said axial passage for avoiding accumulation of scraped paraffin in said recesses.

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