United States Patent [19]

Littmann

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[54] **SEGMENT CUTTER**

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[73] Assignee: **Minnesota Mining and Manufacturing Company,** St. Paul, Minn.

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[52] **U.S. Cl.** **30/124,** 30/292, 83/454

[51] **Int. Cl.** **B26d 7/02**

[58] **Field of Search** ..... 30/124, 286, 289, 290, 292; 83/454, 455, 456, 529; 24/248 R, 248 B, 248 C

[56] **References Cited**

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Assistant Examiner—J. C. Peters
Attorney, Agent, or Firm—Kinney, Alexander, Sell, Steldt & Delahunt

[57] **ABSTRACT**

A segment cutter is formed suitable for cutting segments from a paper tape, such as encephalogram or electrocardiogram charts, which is of a compact and low-profile design. The segment cutter comprises a base member having disposed thereon one or more raised planar surfaces, a platen having an opening or openings corresponding to said planar surface and adapted to receive a length of material from which a portion is to be cut. The platen overlays the raised planar surface retaining the desired portion of the material to be cut and forming a track. A tool having a hard rotating spherical ball adapted to ride in the track is moved around the track the ball exerting pressure against the upper edge of the raised planar surface to effect cutting of the desired portion.

3 Claims, 5 Drawing Figures

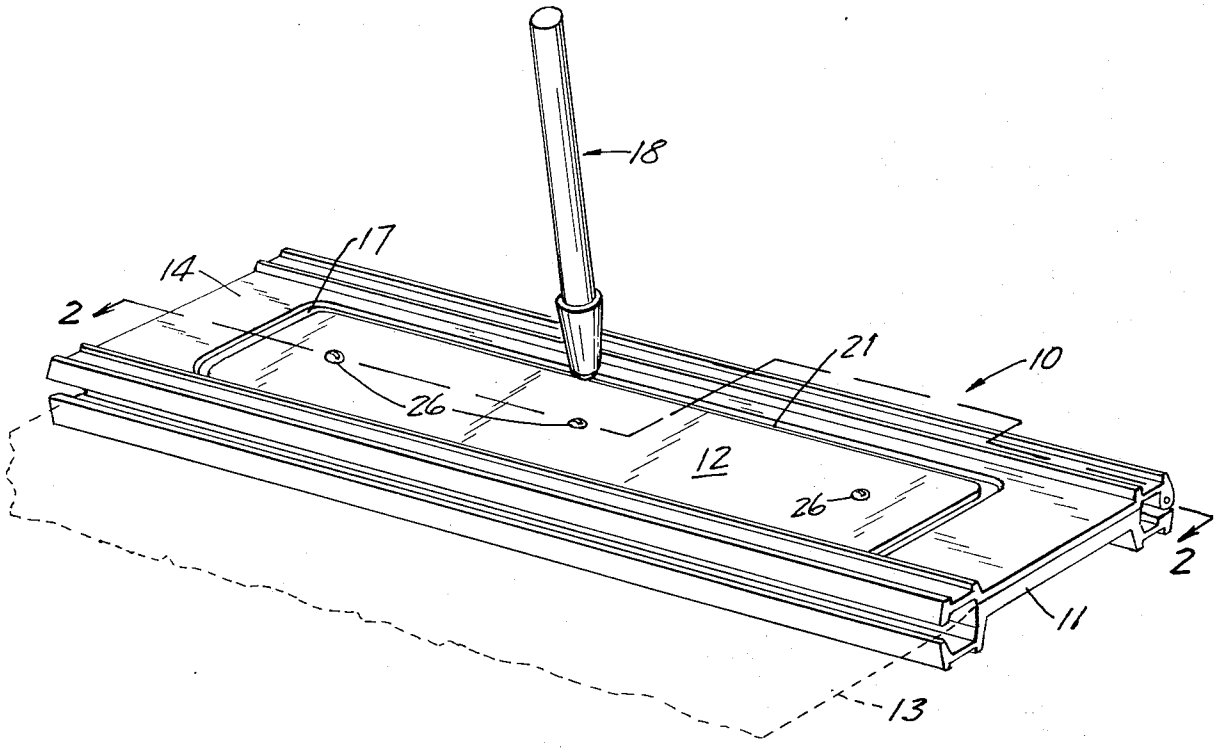


FIG. 1

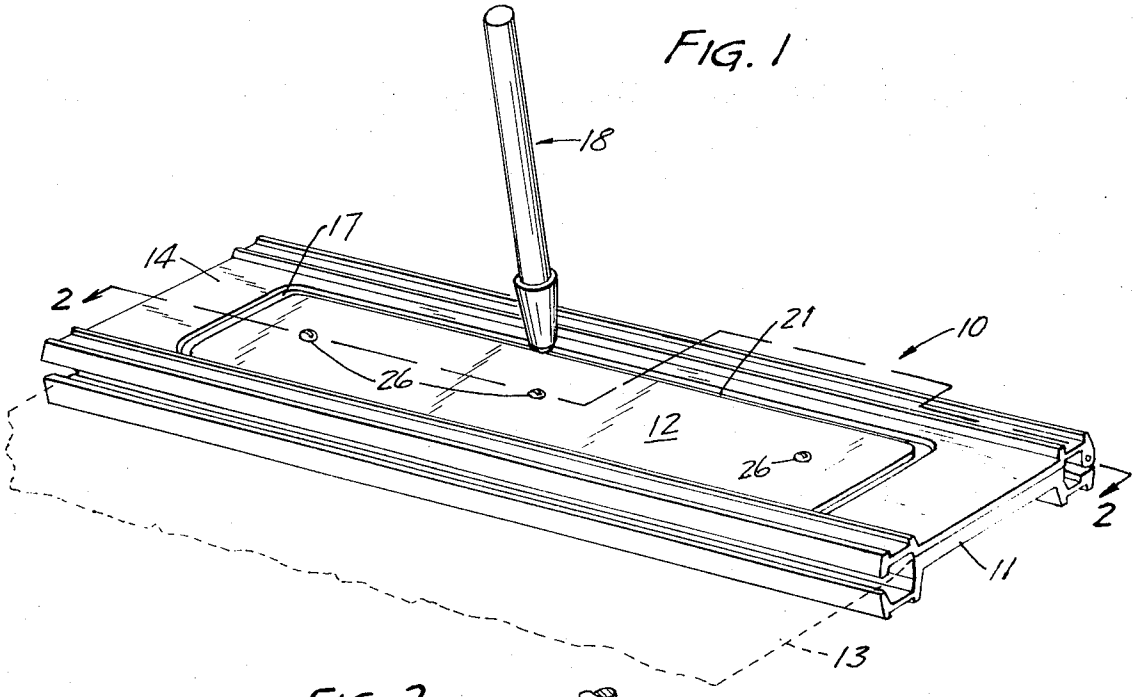


FIG. 2

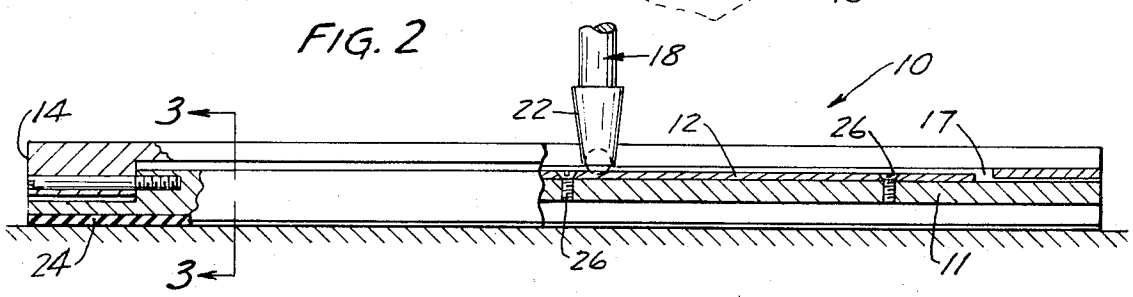


FIG. 3

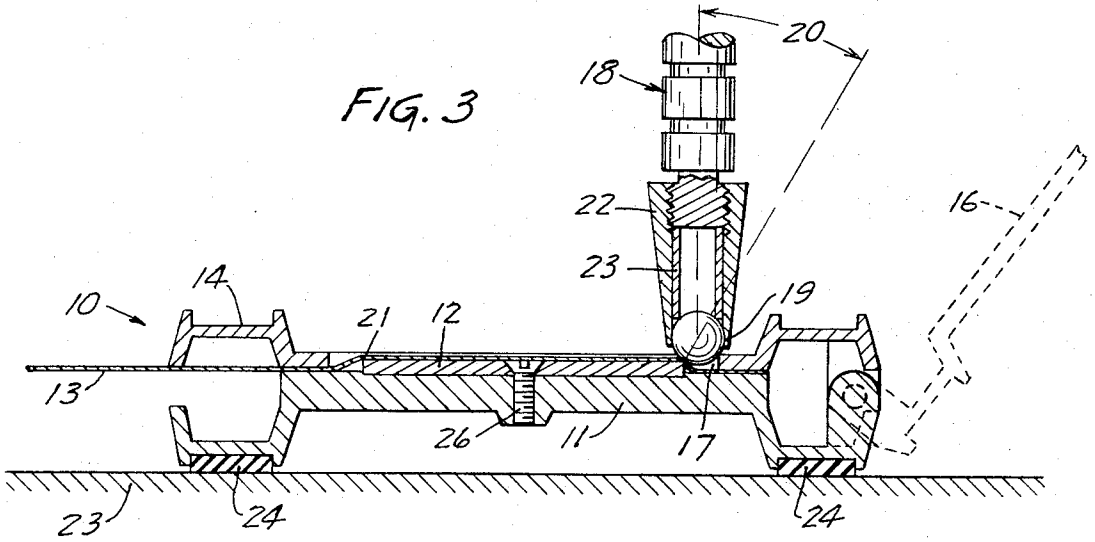


FIG. 4

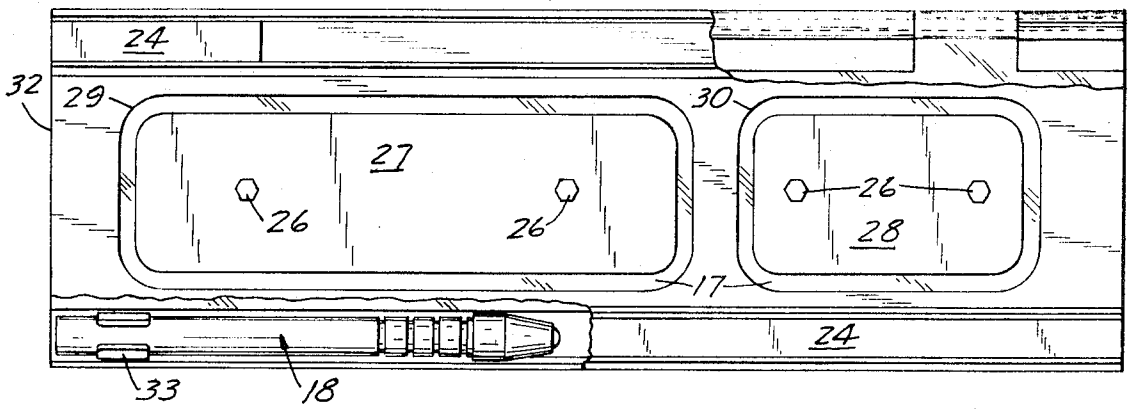
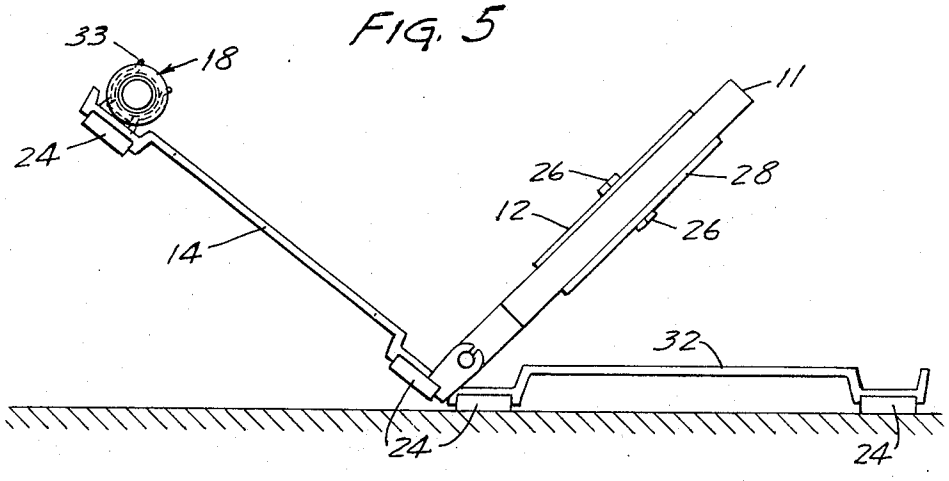

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FIG. 5


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SEGMENT CUTTER

BACKGROUND OF THE INVENTION

In one aspect, this invention relates to a cutter for cutting segments from paper. In yet another aspect, this invention relates to the medical field where it is desired to cut uniform segments from paper, charts, or records.

In the medical field it is generally desirable to cut and retain certain portions of paper, charts, or records such as those normally found in electrocardiogram and encephalogram recordings. Generally speaking, the average record or chart involves a strip or chart of paper several feet in length; however, only certain small representative segments of the chart are normally saved for permanent records. The particular segments chosen for permanent records are removed from the entire strip and mounted on a backing sheet which provides a permanent record for the short length of chart segment cut from the longer paper chart. The backing sheet used for mounting the cut segments is often of a standard format to facilitate accurate record keeping and storage and therfore it is desirable to provide a segment cutter which cuts a uniformly sized specimen.

Generally the desired segments have been cut from the paper web by the use of scissors or the like. In some cases, such as large clinics or hospitals a lever-type die-cutting machine has been employed. The use of scissors is time consuming and results in segments of varying size and shape while the use of the lever-type die cutting machine results in uniform size segments which are easily cut. However, the die cutting machines are quite large, expensive and adapted for cutting numerous segments simultaneously making them undesirable for small offices where space is at a premium and the number of samples cut does not justify an expensive cutter. The prior art also discloses the use of a die-cutting member and roller which effects a perforated cut in the chart. The perforated cut results in a segment which is still attached to the test chart and which has to be removed from the test sample by additional means in order to provide a specimen suitable for mounting.

The segment cutter of this invention overcomes the shortcomings of the prior art die cutters and it provides a compact, lightweight segment cutter which can be easily used in a small area and conveniently stored when not in use. The cutter of this invention cuts uniformly shaped segments from the record chart suitable for mounting on the permanent record sheets presently in use. The cutting member is removable so that it may be replaced when worn, and the segment cutter can be formed with different-sized members allowing smaller segments to be cut from the chart or paper when so desired.

SUMMARY OF THE INVENTION

Briefly, the segment cutter of this invention comprises a base member having disposed thereon at least one raised planar cutting surface, a platen having an opening corresponding to said planar surface which is adapted to receive a length of the material from which a segment is to be cut. The platen overlays the raised planar surface retaining the desired portion of the material and forming a track in which a hard, rotating spherical ball is adapted to ride and move around said track by means of a hand tool. The hard spherical ball exerts pressure against the outer edge of the raised planar surface to cut the desired portion of said material. The planar surface and its corresponding track define the shape and size of the segment to be cut.

BRIEF DESCRIPTION OF THE DRAWINGS

A better understanding of the invention can be had by referring to the accompanying drawing in which like reference numbers refer to like parts in the several views, and in which:

FIG. 1 is a perspective view of one embodiment of this invention having one raised planar cutting surface;

FIG. 2 is a side view in partial section taken along the line 2—2 of FIG. 1;

FIG. 3 is an end view in section taken along the line 3—3 of FIG. 2;

FIG. 4 is a bottom view of a second embodiment of this invention; and

FIG. 5 is an end view of the segment cutter of FIG. 4 showing a segment cutter having raised planar cutting surfaces on both sides.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring initially to FIGS. 1 – 3 a segment cutter **10** is shown comprising a base member **11** having attached thereto a raised planar surface **12** having a peripheral cutting edge **21.** A sheet of paper **13** from which a segment is to be cut is held in place by platen **14** which can be raised as shown in FIG. 3 by phantom lines **16.** The paper **13** is placed on top of planar surface **12** and platen **14** closed over the paper thereby holding the paper securely in place. The platen **14** which overlays the raised planar surface **12** has an opening corresponding in shape and configuration to the raised planar surface thereby forming a track **17** about the periphery of the raised planar surface. A tool **18** having a hard spherical ball **19** is furnished, the ball **19** being of the proper size so that when it is pressed firmly into track **17** pressure is exerted against the cutting edge **21** of raised planar surface **12.**

Hard spherical ball **19** is held in the tool **18** in such a manner that it is easily rotated when the tool is moved along the track **17.** One configuration suitable for holding the ball in a rotatable manner is shown in FIG. **3,** where ball **19** is held in place by sleeve **22** and when tool **18** is pushed down into track **17** ball **19** rides against a porous, oil-impregnated bearing **23** providing a low-friction interface between the ball and the bearing allowing easy rotation of the ball as it moves along the track.

The ball **19** when riding in track **17** forms a cutting angle **20** with upper cutting edge **21** of raised planar surface **12.** This cutting angle **20** is defined by a line drawn from the point of contact between the ball **19** and cutting edge **21** through the center of the ball and the vertical axis of the segment cutter **10.** The cutting angle **20** will generally be in the range of 25 to 55 degrees preferably in the range of 35 to 50 degrees. It has been found angles above 55 degrees or below 25 degrees result in segment cutters which do not function as well as the preferred embodiments and require substantially more force in order to make a clean cut.

The ball can be formed of numerous metals and alloys which are hard and can be finished to form a smooth, spherical shape. A preferred ball is the hardened steel bearing material available as ball bearings from many companies. The ball bearings come in several sizes and are sufficiently hard to insure a long life.

The planar surface **12** is formed of a hard material generally having a hardness greater than 40 Rockwell C preferably harder than 45 Rockwell C, e.g. tempered carbon steel, martensitic stainless steel or heat treated alloy steel and is of a softer material than the ball. The flat planar surface is shown with a smooth upper edge and rounded corners, the rounded corners helping to keep an even pressure between the ball and edge during use as well as contributing to increased life of the cutting edge. It is possible, however, to form a cutting surface with square corners or to form a notched upper edge which would form a perforated cut around the specimen for later detachment of the specimen.

The segment cutter is supported on a base surface **23** which may be a table top, desk top or the like by legs **24** which are normally made of a cushioning material such as rubber or firm foam material which provides a soft support for the segment cutter and also provides a slip resistant surface between the supporting surface **23** and the segment cutter **10.**

When the cutting edge **21** has become worn from repeated use, the flat planar surface **12** can be disengaged by removing the fastening means **26** and a new flat planar surface installed. The replaceability of the planar surface **12** and its associated cutting edge insures that proper cutting action can be maintained over extended periods of time without the need for replacing the entire segment cutter.

A second embodiment of the segment cutter of this invention is shown in FIGS. **4** and **5** wherein both sides of the segment cutter are adapted for cutting segments of varying sizes. As shown in FIG. **4** one side of the segment cutter of this embodiment contains two raised planar surfaces **27, 28** which have corresponding openings **29, 30** in the platen **32.**

FIG. **5** shows the embodiment of FIG. **4** in an open configuration platen **14** and planar surface **12** having a configuration similar to those shown in FIG. **1** and platen **32** having the configuration shown in FIG. **4.** The segment cutter of this embodiment allows different size segment patterns to be cut so that the segment size which best suits the need for accurate record keeping can be cut from any of the various strips or charts common in the medical field. The operation and configuration of this embodiment are similar to that of the embodiment shown in FIG. **1.**

Various modifications and alterations of this invention will become apparent to those skilled in the art without departing from the scope and spirit of this invention, and it should be understood that this invention is not to be limited to the illustrative embodiments set forth herein.

What is claimed is:

1. A segment cutter comprising a base member having disposed thereon at least one raised planar surface having a peripheral cutting edge, a platen having an opening corresponding in shape to said planar surface and adapted to receive a length of material from which a segment is to be cut, said platen overlaying said planar surface and retaining the desired portion of the material, said platen and at least a portion of said peripheral cutting edge of said planar surface forming a track in which a tool having a hard, rotating, spherical ball is adapted to ride for exerting pressure against the outer edge of said raised planar surface to effect cutting of a segment from said length of material.

2. A segment cutter of claim **1** where said raised planar surface is a removable raised planar surface.

3. A segment cutter of claim **1** where said platen is pivotably hinged to said base member.

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Disclaimer

3,787,968.—*David Littmann*, Needham Township, Norfolk County, Mass. SEGMENT CUTTER. Patent dated Jan. 29, 1974. Disclaimer filed Mar. 23, 1976, by the assignee, *Minnesota Mining and Manufacturing Company.*

Hereby enters this disclaimer to claims 1 through 3 of said patent.

[*Official Gazette May 25, 1976.*]