

Sept. 25, 1951

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2,568,754

FACSIMILE RECORDER HELICAL ELECTRODE MOUNTING

Filed Sept. 23, 1946

2 Sheets-Sheet 1

FIG. 1

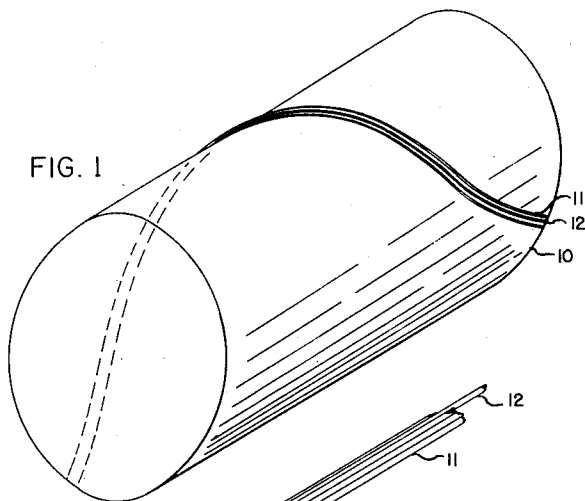


FIG. 2

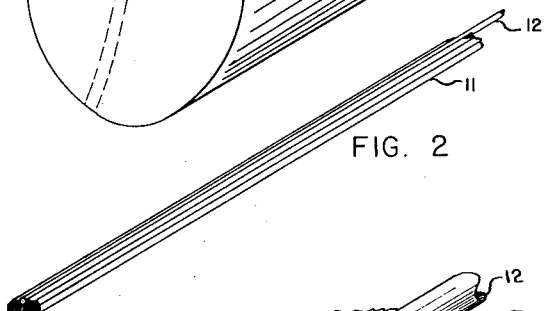


FIG. 5

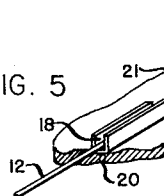


FIG. 3

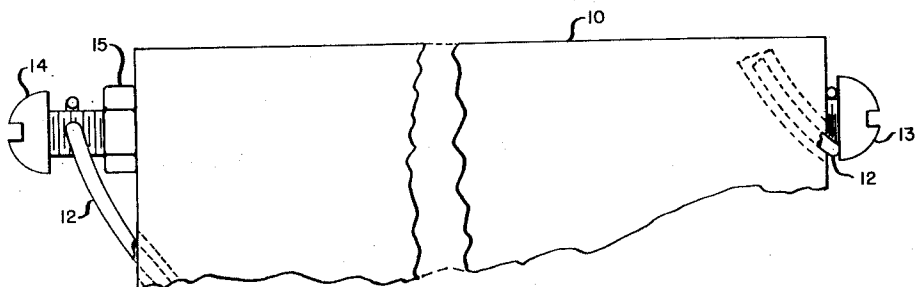
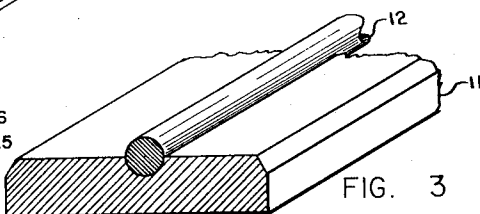


FIG. 4

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2 Sheets-Sheet 2

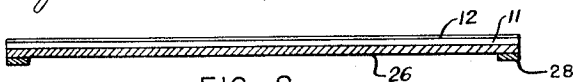
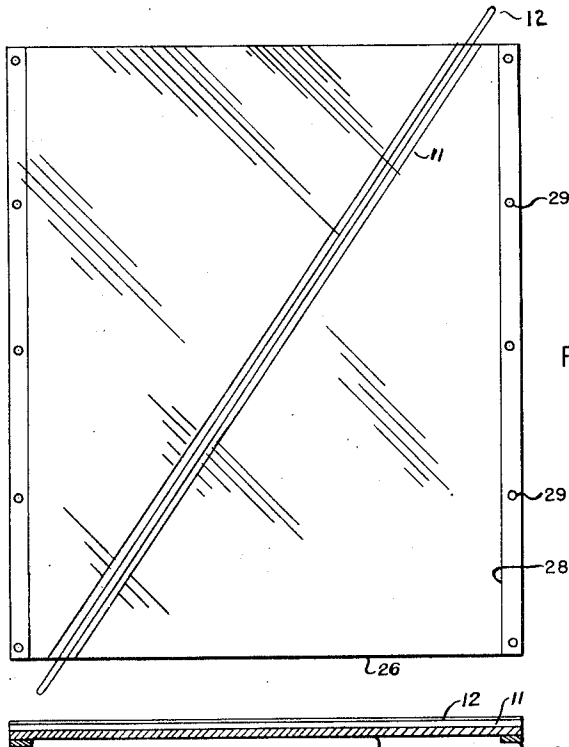
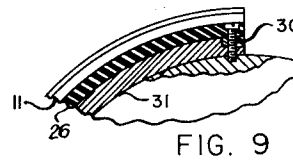
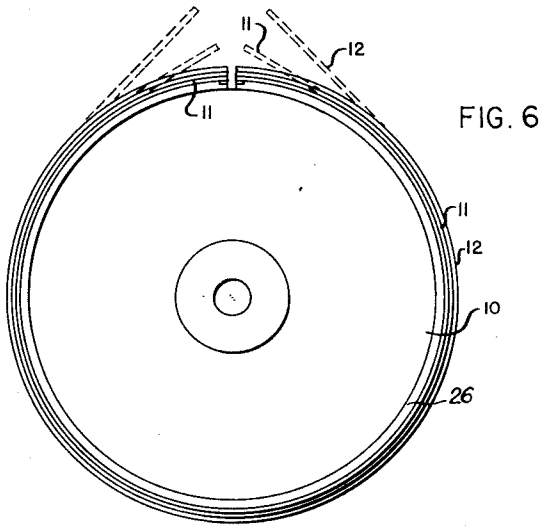


FIG. 7

FIG. 8

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Application September 23, 1946, Serial No. 704,163

2 Claims. (Cl. 346—101)

1

This invention pertains to electronic facsimile equipment, and more particularly to the helix drum of an electronic facsimile recording device.

In devices of the present class, a helix drum is employed in the recording device, having a helical electrode thereon, which, when employed in conjunction with a linear electrode, is used for marking an electrolytic record sheet when the record sheet is drawn between the helical and the linear electrodes.

Heretofore, the surface of the helix drum, which was made of an insulating material, such as Bakelite, was machine tooled so as to result in a narrow ridge of substantially one helical turn for the length of the drum. A small groove was then cut into the ridge as a resting place or bed for the helical electrode.

In the construction of helix drums as used in facsimile recording on electrolytic paper, tooling a Bakelite tube so that a raised helix wire guide is produced as part of the drum itself is a costly and laborious process.

The process is simplified considerably by making use of a helix supporting strip. A strip of flexible plastic material is particularly convenient. The length of the strip is governed by the desired pitch of the helix to be produced. The width and thickness of the strip are controlled by the type of material used for the strip, the desired height of the wire-guide and the dimensions of the drum around which the strip is to be wound.

In the assembly of this type of drum, two points are located, one at each end of the drum on its circumference. The plastic strip is then formed around the drum between these two points and then temporarily fastened.

A straight narrow piece of material, having a groove for the helical electrode, substantially the length of the helical turn, is temporarily secured on the surface of the drum with adjacent ends of the strip placed over two predetermined terminating points on the drum. Due to the physical characteristic of the straight strip, it will form a natural helical curve when temporarily secured to the drum as explained heretofore. The helical electrode is then placed in the groove of the strip, secured to the drum on opposing ends thereof and drawn taut. When the tension on the wire is sufficient, the temporarily secured strip will form a substantially precise helical turn on the drum.

In another form of the invention, a base sheet of material substantially the area of the cylindrical surface of the drum carries a straight narrow strip of material with a groove for the helical conductor cut therein, permanently secured to the base sheet of material at the proper angle.

The base sheet is then suitably secured to

2

the cylindrical surface of the drum. Thereafter, the helical electrode is placed in the groove of the strip on the drum and is drawn taut as set forth heretofore. In this case the helical electrode will have a natural helical curve suitable for line-by-line scanning in a facsimile recorder.

It is, therefore, one object of the present invention to provide a simple, accurate and inexpensive, method of, and means for, mounting a helical electrode on a facsimile scanner drum.

Another object is to provide a helix mounting which may be readily changed in order to vary the height of the electrode or to accommodate an electrode of different cross-section.

A further object of the present invention is to provide a facsimile scanning drum with a helical electrode supporting means formed from a straight piece of material of predetermined dimensions so that when said straight piece of material is properly placed on the scanning drum it will have a natural helical curve suitable for line-by-line scanning in a facsimile recorder.

It is a still further object of the invention to provide a helical electrode support formed from a straight piece of material which is superimposed upon a flat sheet of material so that it may be secured to a scanning drum.

Still another object of the invention is to provide novel adjusting means on the scanning drum for tensioning the helical electrode so that the tautness of said electrode will have a relatively high degree of tension adjustment.

Other and further objects will become apparent to one skilled in the art from a perusal of the disclosure of the present invention. It is to be understood that the present disclosure is by way of illustration only and that variations and modifications in the invention may be made without departing from the spirit and scope of the subjoined claims.

In the drawings:

Fig. 1 represents the helical scanning drum of a facsimile recorder with the helical electrode supporting strip secured thereto.

Fig. 2 is a view of the electrode support strip with the electrode placed in the groove of said strip before they are mounted in helical form.

Fig. 3 is an enlarged partial sectional perspective view of Fig. 2.

Fig. 4 is a partial side view of the helical scanning drum showing one method of securing and adjusting the helical electrodes.

Fig. 5 is a perspective view showing one embodiment of means for obtaining a fine degree of tension on the helical electrode.

Fig. 6 is an end view of the scanning drum having certain portions thereof expanded to indicate their relative position.

3

Fig. 7 shows the straight helical electrode supporting means secured to a flat sheet of material which is placed directly on the cylindrical surface of the drum.

Fig. 8 is an end view of Fig. 7.

Fig. 9 is an enlarged partial sectional end view to show one method of securing the sheet shown in Fig. 7 to the drum.

Referring to the drawings and more particularly to Fig. 1, a helix drum 10 is shown having an electrode support member 11, positioned thereon and an electrode 12 disposed on the electrode support member.

Fig. 2 shows the electrode support member 11 having the electrode 12 disposed in a groove in the electrode support member. This view shows the electrode support member as a straight piece of material as it exists before it is secured to the helix drum.

Fig. 3 is an enlarged portion of Fig. 2 to more clearly indicate the groove in which the electrode rests. It will be noted that the edges of support 11 are chamfered. The degree of chamfer may be increased as the diameter of the helix wire is decreased. The height of the helical electrode above the surface of the drum may be varied by varying the thickness of the support and the depth of the groove.

Fig. 4 shows the helix drum 10 with the electrode 12 secured on opposing ends by screws 13 and 14. Screw 13 has one end of the electrode securely clamped to the end of the helix drum 10. The opposite end of the electrode is passed through a hole in the adjustment screw 14. The desired tension of the electrode 12 is obtained by turning the adjustment screw 14 in a clockwise direction. When the desired tension of the electrode is obtained the locking nut 15 is tightened to hold the screw 14 in a fixed position.

Fig. 5 shows another means of obtaining a degree of tension on the electrode 12. In this view the electrode has a loop 16 formed in one end thereof and is secured to the end of the cylinder by the holding screw 17. A channel member 18 is pivoted to the end of the cylinder 10 by a pin or screw 20. A protuberance 21, formed on one end of the channel member is used to retain the electrode in the channel during the tightening operation of the electrode. The opposing end of the electrode is secured to the drum in any conventional manner such as is shown in reference to Fig. 4. The adjustment screw 22 is threadedly disposed in an adjustment screw support 23 which is secured to the drum by means of screws 24. By rotating the adjustment screw 22 which impinges one side of the channel member 18, tension upon the electrode 12 is obtained. When the proper degree of tension is reached, the lock nut 25 is tightened to hold the screw in the desired fixed position.

Fig. 6 shows another means of employing the straight electrode support member. Taken in conjunction with Fig. 7 there is shown a base member 26, which may be a sheet of flexible material. The electrode support member 11 is secured to the base member in any convenient manner such as by a cement. The electrode 12 is shown disposed on its support member. Actually, the electrode is not usually placed on its support member until after the base member 26 is secured on the drum. The angle of the support member in relation to the edges of the base member 26 will determine the pitch of the electrode when applied to the base member of given proportions. The less the pitch the greater

4

the percentage of underlap. A positioning strip 28 is secured along opposing edges of the base member by cementing same thereto. A series of apertures 29 are made through the base member and the positioning strip. Through the apertures are inserted screws which hold the base member in position on the helix drum. This may be seen more clearly in Fig. 9 wherein the screw 30 is shown holding the base member in position on the drum. The screw passes through a layer of insulating material 31 of the drum proper.

Figs. 7 and 8 show one means of securing the base member to the helix drum, but it is to be understood that the base member may be secured to the helix drum in any convenient or suitable manner. The relative size of the electrode support member will be determined in part by the size and shape of the electrode to be employed, it being understood that the electrode does not necessarily have to be round and may have any desirable cross-sectional shape.

While it is not intended to limit the scope of the invention in cases where electrical insulation is desirable or it is desired to keep metal well away from the record sheet except for the recording electrodes either or both the electrode mounting and base sheet may be made of insulating material. Plastic materials are particularly suitable.

While various modifications of the invention have been shown specifically, it is to be understood that variations and modifications in the invention may be made to lend itself for the particular purpose desired.

What is claimed is:

1. In a facsimile scanner, the combination of, a scanner drum, a flexible strip of insulating material passing over and in contact with a portion of the surface of said drum in the form of a helix including a groove along the length of said strip, a metallic recording electrode, and means on the drum engaging the ends of the recording electrode for stretching said electrode along said groove and urging said strip against the surface of said drum.

2. For use in an electrical recorder, a helical electrode construction comprising a drum having cylindrical and end surfaces, a metallic wire recording electrode, means for fastening one end of said wire electrode to one end of said drum, screw and lock nut tightening and fastening means at the opposite end of the drum for the opposite end of the wire electrode, the wire electrode being wrapped helically around the cylindrical portion of the drum, and a flexible straight grooved strip of insulating material wrapped helically around the drum under the wire electrode with the electrode positioned in the groove of the strip, whereby the wire electrode, when one end thereof is tightened and locked by said means, is rigidly maintained in a helical form and may easily be replaced when necessary due to wear.

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