United States Patent

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[45] **Jan. 25, 1972**

[54] ELECTRICAL RECORDER UTILIZING A CHEMICALLY-TREATED WEB

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[21] Appl. No.: **852,968**

Related U.S. Application Data

[63] Continuation of Ser. No. 595,778, Nov. 21, 1966, abandoned.

[52] **U.S. Cl.**.....**346/145,** 346/74 E, 346/101

[51] **Int. Cl.**.....**G01d 15/06,** G01d 15/20

[58] **Field of Search**.....346/74 E, 74 ES, 74 CH, 74 S, 346/74 SB, 74 SC, 101, 145

[56] **References Cited**

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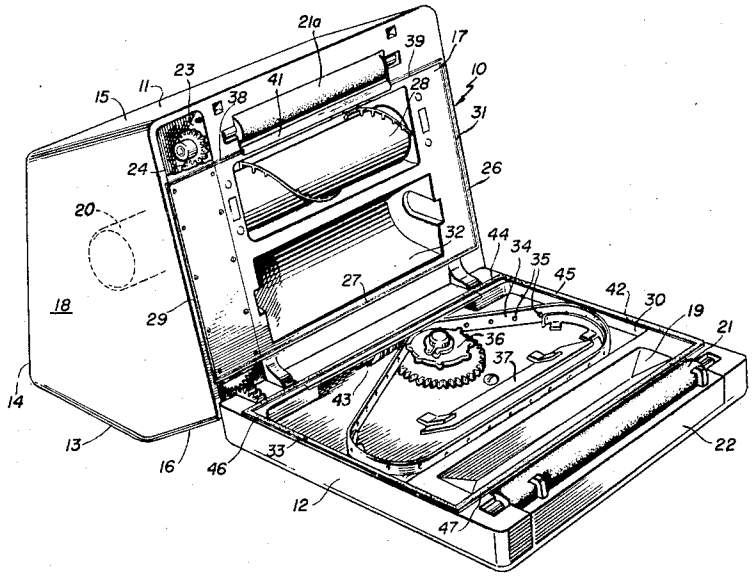
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[57] **ABSTRACT**

This invention relates to a recorder and, more particularly, to apparatus arranged to receive electrical signals and convert them to visible indicia on a chemically-treated web, means being provided to prevent the drying of the web.

2 Claims, 4 Drawing Figures



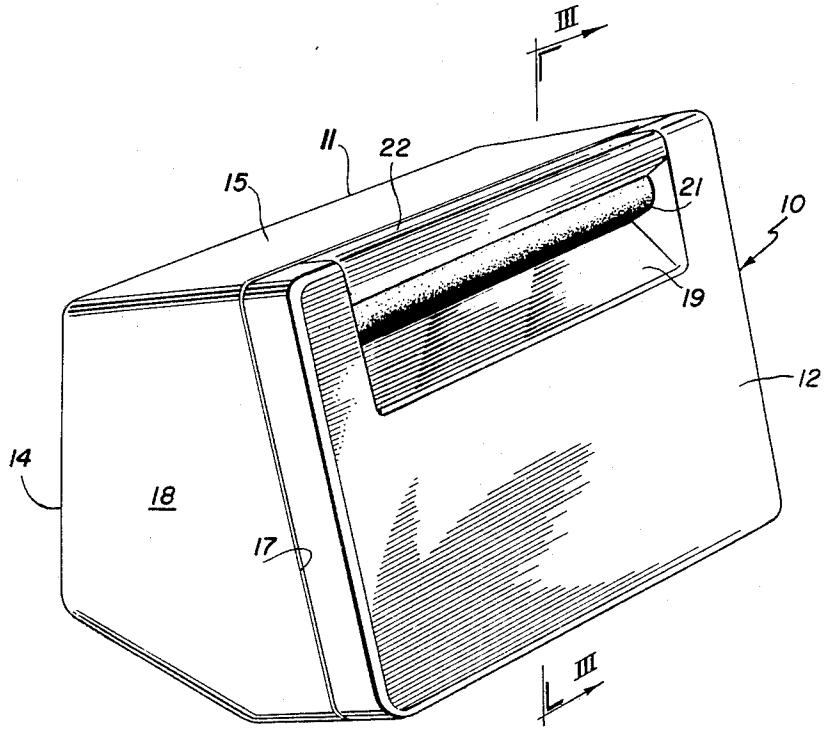


FIG. 1

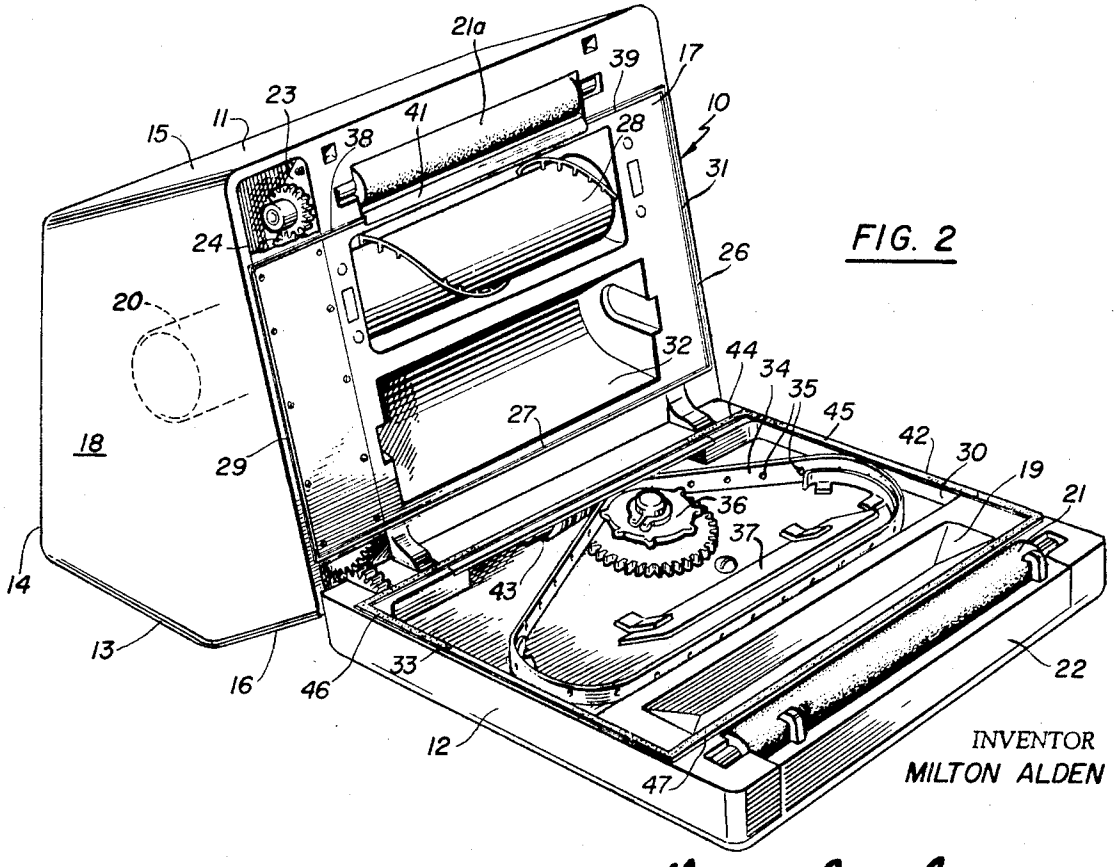


FIG. 2

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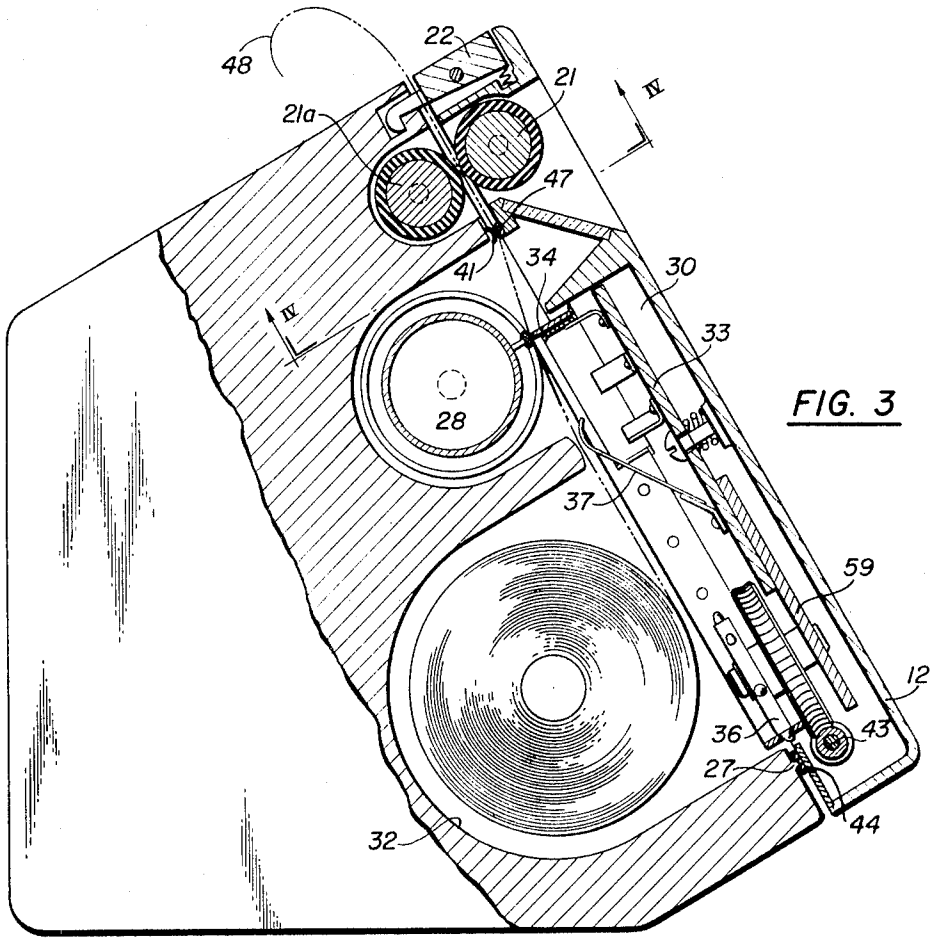


FIG. 3

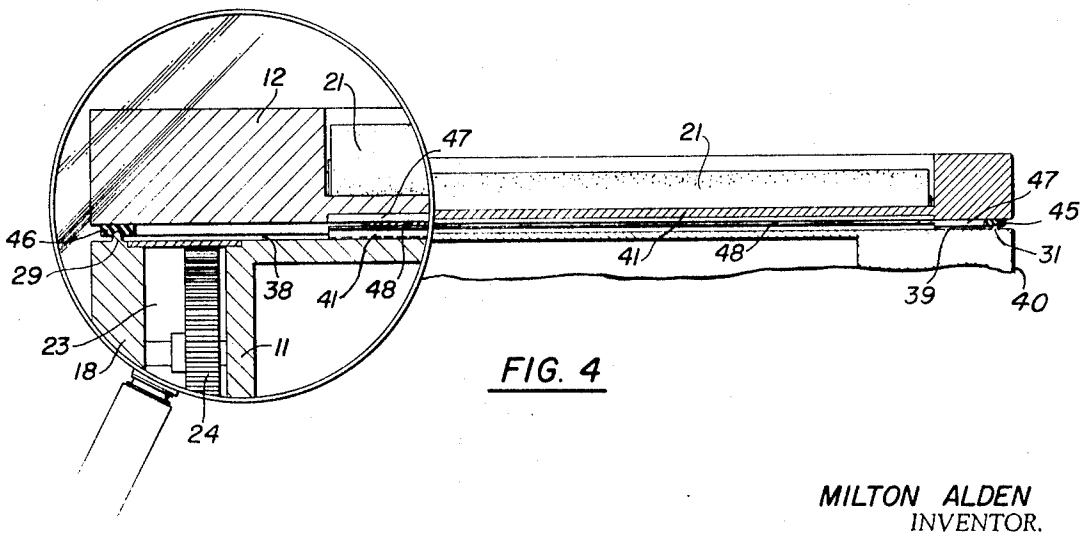


FIG. 4

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ELECTRICAL RECORDER UTILIZING A CHEMICALLY-TREATED WEB

The present application is a continuation of application, Ser. No. 595,778, filed Nov. 21, 1966 and now abandoned.

It is well known in the communications field to transmit visual information by use of an electrical signal whose intensity is modulated. A chemically treated web of paper is passed between scanning electrodes on which the signal is impressed. In the most practical arrangements, the chemical is in liquid form and the web is impregnated with it. One of the important factors governing the resultant visual image on the web is the degree to which the web remains moist. For instance, when the recorder is idle between transmissions, the portion of the web between the roll and the electrodes is exposed to a drying atmosphere. To assure a satisfactory image at the time of the next transmission, it is necessary, before the transmission starts, for an attendant to pull the web through the apparatus until only the relatively moist web from the roll lies in the recording area. The dry portion so removed is not used for recording and is, therefore, wasted; in many situations, this means that (with intermittent transmission) as much as one-half of the expensive web is wasted. In the case of unattended recorders, the visual image is inferior because the recording is almost always made on a portion of the web which has had an opportunity to dry out. Furthermore, in this last case a further difficulty is experienced where the transmissions are sporadic because the amount of drying is not uniform from one transmission to the next and variations in quality of the visual image result. Attempts have been made in the past to enclose the web to prevent evaporation of the solvent in the chemical, but the resultant constructions have always been complicated and expensive. This has militated against the use of such constructions in an inexpensive recorder. These and other difficulties experienced in the prior art devices have been obviated in a novel manner by the present invention.

It is, therefore, an outstanding object of the invention to provide a recorder which has an effective but inexpensive arrangement for maintaining the recording web out of exposure to the atmosphere.

Another object of this invention is the provision of a compact recorder using a moist, chemically treated web, wherein the web is totally enclosed until recording has taken place.

A further object of the present invention is the provision of a recorder in which the degree of moistness of the web is maintained uniform.

It is another object of the instant invention to provide a recorder using a moist web in which the quality of recording does not vary, despite the intermittent arrival of transmissions.

It is a further object of the invention to provide a recorder in which a sealing means is provided whereby the web is totally enclosed until recording has been completed.

With these and other objects in view, as will be apparent to those skilled in the art, the invention resides in the combination of parts set forth in the specification and covered by the claims appended hereto.

The character of the invention, however, may be best understood by reference to one of its structural forms, as illustrated by the accompanying drawings in which:

FIG. 1 is a perspective view of a recorder embodying the principles of the present invention,

FIG. 2 is a view of the recorder with the cover open,

FIG. 3 is a vertical sectional view of the recorder taken on the line III—III of FIG. 1, and

FIG. 4 is an inclined sectional view of the recorder taken on the line IV—IV of FIG. 3.

Referring first to FIG. 1, wherein are best shown the general features of the invention, the recorder, indicated generally by the reference numeral **10**, is shown as consisting of a main body **11** to which is fastened a cover **12**. The main body is provided with a bottom surface **13**, a vertical rear surface **14**, an upwardly and forwardly inclined top surface **15**, and an upwardly and forwardly inclined front surface **16**. It is also provided with an upwardly and rearwardly inclined front surface **17** against which the cover **12** lies and it is provided with vertical side surfaces **18** and **40** (see FIG. 4). The upper part of the cover **12** is provided with a window **19** within which can be seen a roller **21**. Overlying the window **19** and forming one edge thereof is a latch bar **22**.

FIG. 2 shows the recorder with the cover **12** in open, horizontal position. Extending along the side surface **18** of the main body is a recess **23** containing a drive transmission mechanism connected to a motor **20**. At the bottom of the recess is a pinion gear **24** mounted on a horizontal shaft **25**. Underlying the roller **21** is a scanning electrode **28**. Located below the electrode **28** is a semicylindrical recess **32** adapted to carry a roll of chemically treated paper. This paper is of the type used in facsimile recording and, therefore, carries chemicals which provide a visible trace when electrical current is passed through the paper from one electrode to another.

Located on the inside of the cover **12** in a recess **30** is a support plate **33** on which is mounted an electrode **34**. This electrode consists of a continuous band of metal provided with apertures **35** permitting it to be driven by a sprocket **36**. Located within the loop of the electrode **34** is a pressure plate **37**.

The cover **12** and its associated equipment is hingedly attached to the main body **11** by means of a horizontal hinge shaft **43**. The sprocket **36** and, therefore, the electrode **34** is driven through this hinge shaft by the gear **24**. As is evident in FIGS. **2** and **3**, the paper tension plate **37** extends at a substantial angle to the plate **33**, but is attached thereto in such a way as to have a resilient action relative to the plate. The plate **33** is provided with a movable plate **59** (see FIG. **3**) which carries the sprocket **36** and provides for adjustment.

Extending around the front surface **17** of the main body **11** is a ridge **26** formed integrally with the body; it consists of a lower portion **27** underlying the recess **42**, a side portion **29** extending upwardly from one end of the lower portion, and a side portion **31** extending upwardly from the other end of the lower portion. Extending inwardly from the upper end of the side portion **29** is a portion **38**. A similarly inwardly extending portion **39** is associated with the upper end of the side portion **31**. A flexible seal **41** extends between the inner ends of the portions **38** and **39**. The lower portion **27**, the side portions **29** and **31**, the inwardly extending portions **38** and **39**, and the flexible seal **41** form a rectangular figure within which lies the recess **32** and the scanning electrode **28**.

Associated with the inner surface of the cover **12** is a seal **42** consisting of a strip of elastomer material, such as Teflon, which engages the ridge **26** when the cover is closed. It is provided with a lower portion **44** which is approximately the same length as the lower portion **27** of the ridge **26** and is the same distance from the axis of the hinge shaft **43**, so that the ridge embeds itself in the elastomer strip when the cover is closed. The seal **42** has a side portion **45** which engages the side portion **31** of the ridge; it also has a side portion **46** which contacts the side portion **29**. Finally, the seal **42** has an upper portion **47** which extends across the inner surface of the cover **12** from the side portion **45** to the side portion **46** on a narrow dividing wall between the window **19** and the recess **30** in which the support plate **33** lies. Generally speaking, the seal **42** is rectangular and extends around the edge of the recess **30**.

The operation of the apparatus will now be readily understood in view of the above description. In setting up the recorder, a roll of sensitized paper web **48** is placed in the recess **32** (see FIG. **3**). It is threaded over the scanning electrode **28**, over the roller **21***a*, and over the back surface **15** of the main body **11**. The cover **12** is then closed, the fingers associated with the latch **22** snapping into recesses in the main body to hold it in place. When the motor **20** is energized, the electrodes **28** and **34** and the roller **21***a* are driven. The flow of electricity from the electrode **28** to the electrode **34** produces a visible message or diagram on the surface of the paper. Eventually, the paper is moved upwardly by the action of the roller **21***a* cooperating with the roller **21** in the cover, so that the message is exposed in the window **19**.

The web **48** leaves the recess **32** and passes between the electrodes **28** and **34**. A degree of back tension is produced because the roll in the recess **32** resists being unwound and is provided with a resilient mounting shaft that presses against the ends of the recess to promote a slight "drag." The pressure plate **37** presses against the bight of the web between the roll and the electrodes. It passes between the upper portion **47** of the seal **42** on the cover and the resilient seal **41** on the main body as it passes from the electrodes to the rollers **21** and **21***a*. The web **48** is moist with its active electrosensitive chemical and it is important that the solvents and electrolytes do not dry out. For this purpose and in accordance with the present invention, it is totally enclosed in an airtight chamber until it has received a message and leaves under the action of the rollers. Along the side **18**, the side portion **29** of the ridge **26** on the main body presses into the side portion **46** of the seal **42** on the cover. Similarly, along the side **40** the side portion **31** of the ridge **26** presses against the side portion **45** of the seal **42**. At the bottom of the recorder the lower portion **27** of the ridge presses against the lower portion **44** of the seal **42**. At the top of the recorder the chamber is sealed by the upper portion **47** of the seal **42** pressing against the web **48** and against the resilient seal **41**; at the sides the portions **38** and **39** of the ridge **26** on the body press against the upper portion **47** of the seal **42** on the cover.

It can be seen, then, that the web **48** is totally enclosed until it passes between the seal **41** and the seal **47**. Even after the web leaves the roll and passes out of the recess **32** it remains moist. When a pause occurs in reception of messages and the web lies exposed between the roll and the electrodes, it does not dry out. Therefore, when message reception is resumed, the electrochemical quality of the web is still at its optimum value and a good message is produced. There is, therefore, no difference in the quality of the visual image, irrespective of the fact that the period of time between messages varies by large amounts. This is particularly important where there is no operator present to assure that enough of the leading end of the web is pulled out to assure a moist web at the point of electrode activity. This makes the recorder particularly useful as a small, unattended unit for use in a company network, where it might be located at the desk of an executive who is often away from his desk. There is also a saving in cost of operation of the unit because it is not necessary to discard a "dry" leading end of the web in order to receive a good visual image.

It is obvious that minor changes may be made in the form and construction of the invention without departing from the material spirit thereof. It is not, however, desired to confine the invention to the exact form herein shown and described, but it is desired to include all such as properly come within the scope claimed.

The invention having been thus described, what is claimed as new and desired to secure by Letters Patent is:

1. A recorder for use with a chemically treated paper web comprising:

a. a main body;

b. a closed planar ridge portion on said main body bounding an area thereon;

c. a paper storage compartment located within the area bounded by the ridge portion of said main body;

d. a paper web stored in said compartment;

3. a recording apparatus located within the area bounded by the ridge portion of said main body adjacent to said paper storage compartment;

f. a cover overlying said paper storage compartment and said recording apparatus and adapted to be fastened to said main body;

g. sealing means in the form of a closed planar figure conforming in shape to that of the ridge portion of said main body, said sealing means being resilient and being adapted to yieldably conform to the shape of the ridge portion of said main body to effectively seal the area bounded thereby and to permit the exit therethrough of said paper web; and

h. driven rolls mounted externally of said sealing means and adapted to pull said paper web through said sealing means.

2. A recorder as recited in claim **1**, wherein a window is provided in the cover adjacent the driven rolls and outside the area bounded by the ridge portion.

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