Feb. 18, 1964 O. E. HULL 3,121,604

DISPLAY AND RECORDING INSTRUMENT

Filed March 19, 1962 3 Sheets-Sheet 1

Fig. 1

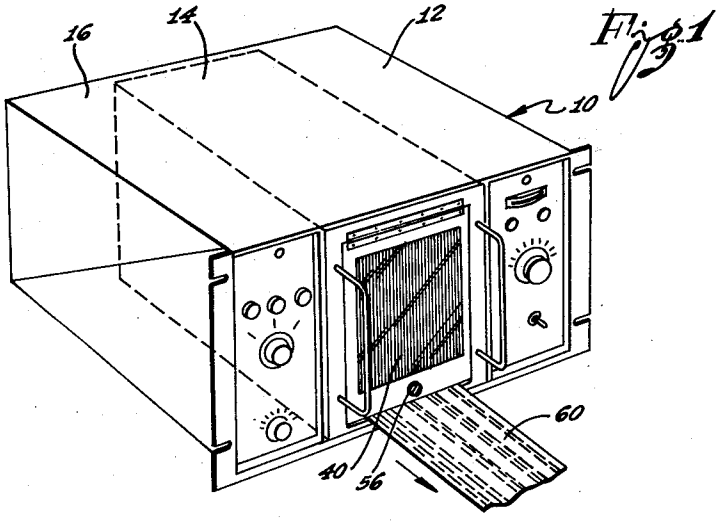
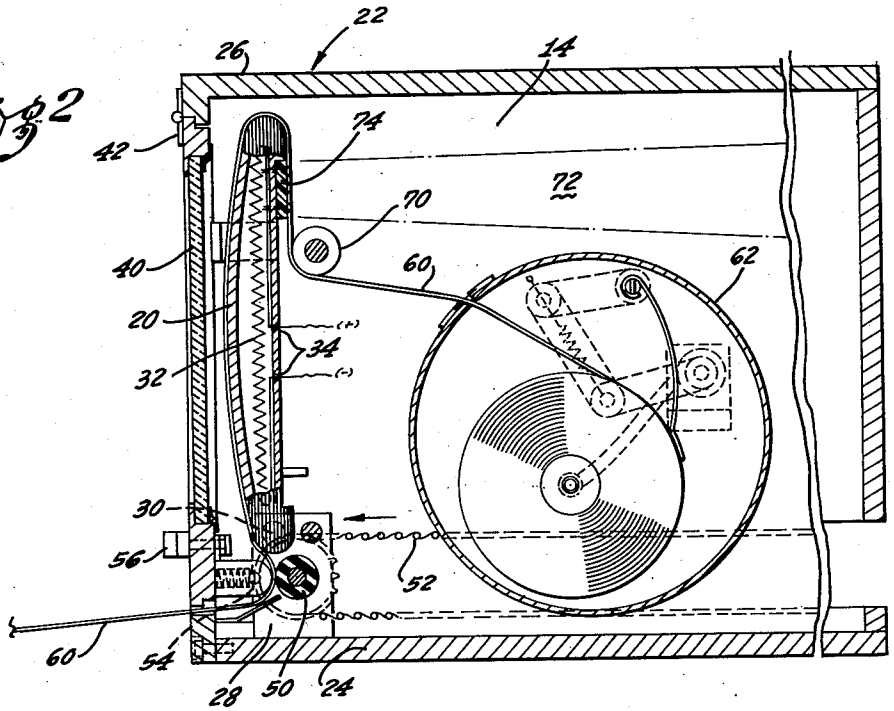


Fig. 2



INVENTOR:
Otis E. Hull

By Keith D. Beecher
Attorney

Feb. 18, 1964 O. E. HULL 3,121,604

DISPLAY AND RECORDING INSTRUMENT

Filed March 19, 1962 3 Sheets-Sheet 2

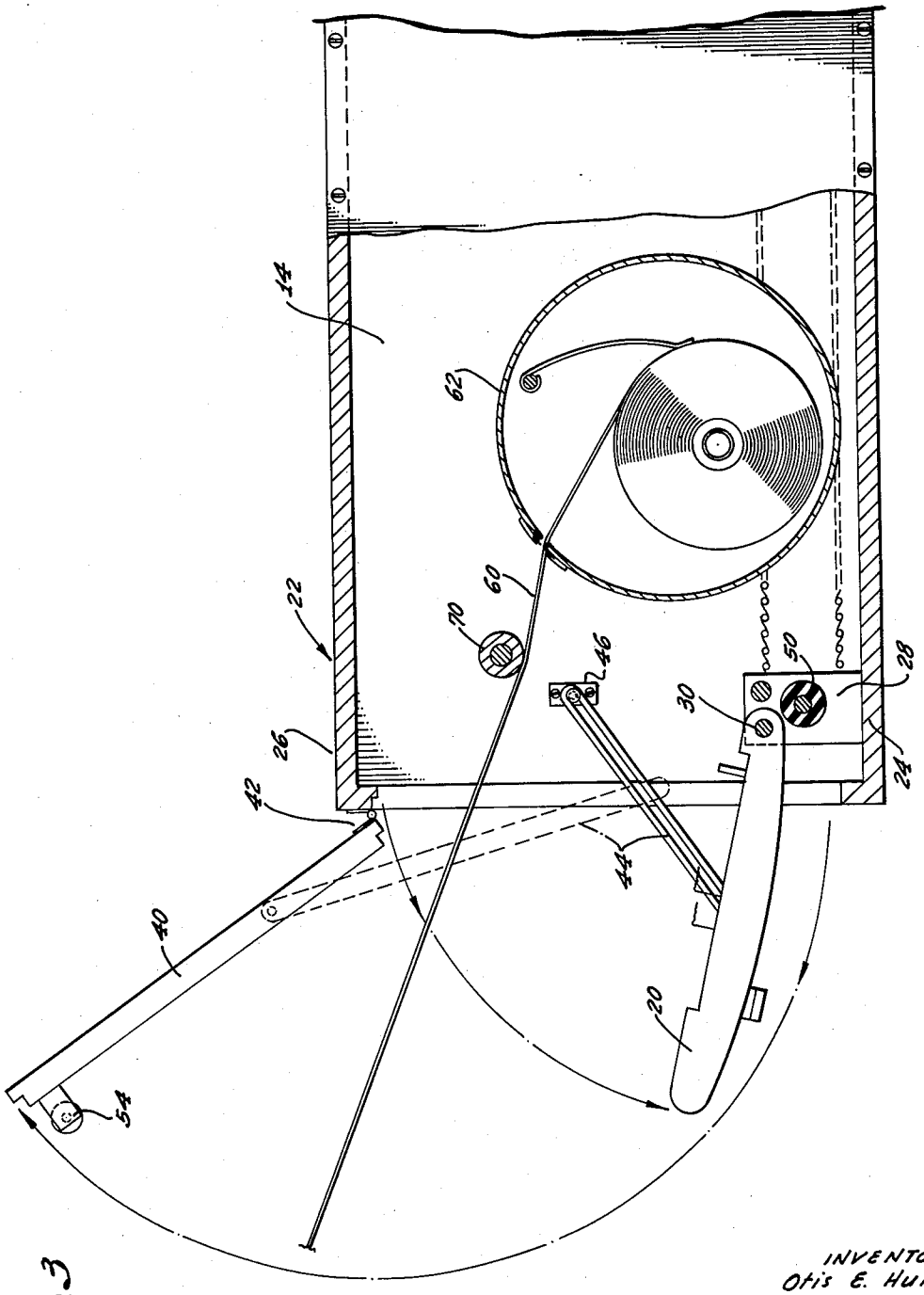


Fig. 3

INVENTOR:
Otis E. Hull

By Keith A. Brucker

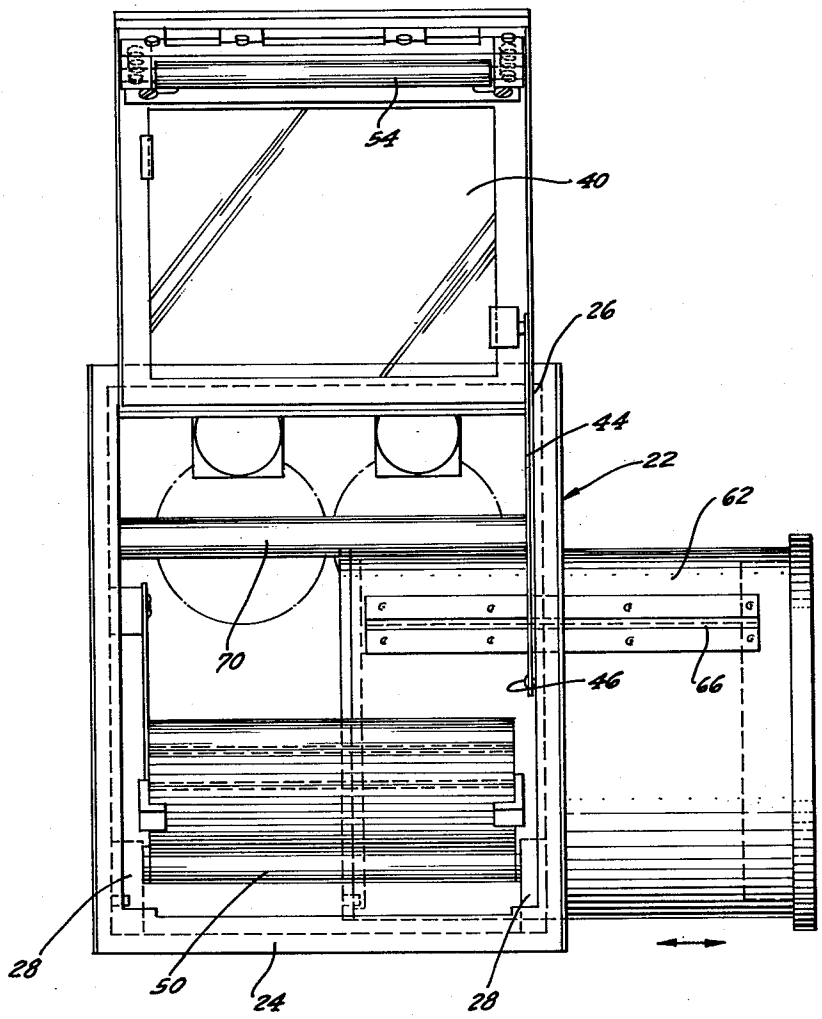
Attorney

Feb. 18, 1964 O. E. HULL 3,121,604

DISPLAY AND RECORDING INSTRUMENT

Filed March 19, 1962 3 Sheets-Sheet 3

Fig. 4



INVENTOR:
Otis E. Hull
By Keith D Beecher
Attorney

United States Patent Office 3,121,604 Patented Feb. 18, 1964

3,121,604

DISPLAY AND RECORDING INSTRUMENT

Otis E. Hull, South Pasadena, Calif., assignor to Hull Instruments, Inc., South Pasadena, Calif., a corporation of California

Filed Mar. 19, 1962, Ser. No. 180,510
8 Claims. (Cl. 346—22)

The present invention is concerned with a read-out, display and recording instrument which is capable of responding to electrical input signals to display and record numeric or other characters corresponding thereto.

The electronic system and circuitry incorporated in the instrument is fully disclosed and claimed in copending application Serial No. 173,904, filed February 19, 1962, of the present inventor. The present invention is directed to the mechanical details of the instrument by which a strip of sensitized recording paper is transported through the instrument.

As described in detail in the copending application, the instrument under consideration includes, for example, one or more cathode-ray display tubes. These tubes are controlled in a manner such that they are caused to trace out the corresponding characters on their respective faces, or display screens, in response to the input signals. The manner in which the cathode-ray tubes are controlled to achieve this function is fully described in the copending application.

As will be described herein, a light sensitive paper is drawn across the optical path from the face of the cathode-ray tubes to be exposed by the characters displayed thereon, and the exposed paper is then drawn across a heated platen for developing purposes. A permanent record is, thereby, provided on the sensitized paper of the characters successively displayed on the faces, or display screens, of the cathode-ray tubes. Light sensitive recording paper, which may be developed by heat, is well known, and need not be described in detail herein.

An important object of the present invention is to provide an improved transport apparatus for the strip of sensitized paper, by which the paper is continuously drawn across the optical path from the faces of the cathode-ray tubes in the instrument, and thence across a heated platen to develop the exposed characters on the paper.

A further object of the invention is to provide such an improved apparatus which is capable of drawing the paper with a positive action through the instrument, and which is eminently simple to adjust and place into operation, the apparatus requiring no awkward threading of the paper through drive rollers, sprockets, or the like.

In the embodiment to be described, the heated platen for the sensitized paper is in the form of a flat smooth member which is hinged at the front of the instrument. A front cover, with a transparent portion, is also hinged at the front of the instrument to be adjacent the platen, when the cover and platen are closed, the cover and platen then being in a spaced parallel relationship.

The apparatus of the invention is constructed so that a cartridge of sensitized paper may be inserted into the instrument simply and conveniently, as will be described. As an initial operation, the front cover and the platen are opened, and the paper from the cartridge is drawn manually through the open front of the instrument. Then, the platen and cover are closed.

The operations described in the preceding paragraph cause the sensitized paper to extend up over the top edge of the platen and down through the bottom of the front cover. The operations also cause a pressure roller on the front cover to press the paper against a drive capstan in the housing so that the paper may be drawn by the drive capstan through the instrument. These simple operations preclude the necessity for threading of the sensitized paper through drive sprockets, and the like, as is the case with most prior art instruments.

Therefore, and as noted above, the display and recording instrument of the invention has the feature of being extremely simple to place into operation, and of being constructed to obviate the awkward and time-consuming initial adjustment operations necessary in most prior art instruments of this general type.

Other objects and features of the invention will become apparent from a consideration of the following specification, when taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a perspective view of a complete instrument capable of responding to input signals to record characters on a recording medium, and being constructed to incorporate the improved transport mechanism of the present invention;

FIGURE 2 is a side sectional view of one of the components of the instrument of FIGURE 1, and revealing the manner in which the recording medium is drawn through the instrument, in accordance with the concepts of one embodiment of the present invention;

FIGURE 3 is a side sectional view of the component of FIGURE 2, but with various members in an open position, to show the manner in which the recording medium is first drawn into an operating position; and

FIGURE 4 is a front view of the component of FIGURE 2, and showing the manner in which a cartridge of the recording medium may be inserted into the instrument.

As shown in FIGURE 1, the instrument illustrated therein is designated generally as **10**. The particular instrument **10** includes three components designated **12**, **14** and **16**. The components **12** and **16** constitute the electronic portion of the instrument, which portion is described and claimed in the copending application, referred to above. The mechanical transport elements of the instrument **10** are included in the component **14**, and these elements form the subject matter of the present invention.

The transport mechanism included in the component **14** includes a platen member **20**. The component **14** includes a housing **22** which has an open front end portion, and which also includes a bottom wall **24** and a top wall **26**. The platen **20** is mounted adjacent the open front end portion of the housing.

As illustrated, for example, in FIGURE 2, a pair of mounting blocks **28** are supported on the bottom wall **24** adjacent the open front end portion of the instrument. The platen **20** is pivotally mounted on the blocks **28** by means, for example, of a pivot pin **30**.

The platen **20** is movable about its hinge or pivot point **30** from a closed position, as shown, for example, in FIGURE 2, to an open position as shown, for example, in FIGURE 3. When the platen **20** is in its closed position, it extends almost completely across the open front of the housing **22**. However, when the platen is in its open position, it uncovers the major portion of the front end of the housing **22**, as shown in FIGURE 3.

The platen **20** is a flat hollow member, and an electrical heating element **32** is mounted in the interior of the platen. This heating element is energized by appropriate electrical leads, such as the lead **34**, which are connected to a suitable energizing source (not shown).

The front surface of the platen **20**, that is the surface facing the front end of the housing **22**, is bowed into a convex configuration, as best shown in FIGURE 2. This front surface of the platen is heated by the heating element **32**. The upper free edge of the platen **32** has a

smooth arcuate configuration, as also shown in the presentations of FIGURES 2 and 3.

The instrument also includes a cover member 40 which has a transparent portion, and which is hinged to the top wall 26 of the housing 22 by means of a hinge 42. The cover member 40 is also pivotally movable from a closed position in which it extends across the open front end portion of the housing 26 (FIGURE 2) adjacent the front surface of the platen 20 and spaced slightly from that surface; to an open position, as shown in FIGURE 3. A suitable sliding bracket assembly 44 is pivotally mounted on a mount 46 in the housing 22, and the bracket assembly 44 includes arms coupled to the platen 20 and the cover member 40. This bracket assembly limits the open position of the platen member 20, and it also serves to hold the cover 40 in its open position, as shown in FIGURES 3 and 4.

A capstan drive roller 50 is rotatably mounted on the blocks 28 adjacent the open front end of the housing 22, and the capstan drive roller extends transversely across the bottom wall 24. The capstan drive roller 50 is rotatably driven by a suitable drive means (not shown) through a drive belt 52. A spring-loaded pressure idler roller 54 is rotatably mounted on the cover 40. This idler roller extends transversely across the cover member 40 adjacent its lower edge, and it is adapted to engage the capstan roller 50, when the cover 40 is in its closed position, as shown in FIGURE 2. An appropriate latch mechanism 56 is provided for holding the cover securely in its closed position.

A roll of sensitized paper 60 is supported in a usual cylindrical cartridge 62. The cartridge 62 may be inserted through an aperture in the side of the housing 22, and it is held in position by spring-loaded stops in usual manner. The sensitized paper 60 is supported on a spring-loaded roll in the cartridge 62, and it may be drawn through a slot 66 in the cartridge. The construction of the cartridge itself, and of its internal components, is known. Since the cartridge assembly, per se, forms no part of the present invention, its details will not be described.

An idler guide roll 70 is also mounted in the housing 24, and the guide roll 70 extends across the housing adjacent the cartridge 62, as illustrated in FIGURES 2 and 4, for example.

As fully explained in the copending application, referred to above a pair of cathode-ray tubes are supported in the housing 22, and an optical system of any appropriate form is incorporated to direct the display from the faces, or display screens, of the cathode-ray tubes along an optical axis 72 as designated by the broken line in FIGURE 2.

The positioning of the platen 20 is such that, when the platen is in the closed position shown in FIGURE 2, the upper portion of its rear surface extends across the optical path 72. This portion of the platen may, for example, have a strip 74 of Teflon extending across it. The guide roller 70 is positioned so that when the instrument is closed, as shown in FIGURE 2, the sensitized paper 60 rides up across the strip 74 and over the arcuate top edge of the platen 20, as illustrated in FIGURE 2.

To load the sensitized paper into the instrument, the cartridge 62 is inserted through one side of the instrument, as shown in FIGURE 4, into place in the instrument. The end of the sensitized paper is then drawn out through the slot 66 and through the open front end of the instrument, as shown in FIGURE 3. The platen 20 is then pivotally moved up into its closed position to cause the sensitized paper to ride up across the strip 74 and over its arcuate top edge, as described. The front cover 40 is then moved down into position, to cause the sensitized paper 60 to be disposed between the spring-loaded idler roller 54 and the capstan drive roller 50. The bottom end of the cover 40 is spaced from the bottom wall 24 to form an exit for the sensitized paper 60.

As observed in FIGURE 2, when the cover is moved to its closed position, the idler roller 54 squeezes the paper 60 against the capstan drive roller 50. Therefore, the rotation of the capstan roller 50 causes the paper to be drawn out of the cartridge 62 and along the path illustrated in FIGURE 2. The various characters displayed on the screens of the cathode-ray tubes are projected along the path 72 to expose the paper 60 as it is drawn over the strip 74 across that path. The subsequent heating of the paper as it is drawn down the front surface of the platen 20 causes the characters exposed on the paper to be developed, and the resulting visual characters can be observed through the transparent portion of the cover 40. The sensitized paper then passes through the exit at the bottom of the cover 40 to an appropriate permanent storage file.

The mechanism of the invention is advantageous, therefore, in that the transport mechanism may be placed into an operative condition, merely by drawing the sensitized paper through the open front of the instrument, and by then closing the platen and the cover. The paper is then positioned to be drawn through the instrument without any need for awkward threading or stringing operations.

While a particular embodiment of the invention has been described, it is evident that modifications may be made. The present invention is intended to cover all such modifications as fall within the scope of the invention.

What is claimed is:

1. An instrument for recording display characters including: a housing having an open end portion; means within said housing for receiving a quantity of sensitized paper; a platen member mounted at said open end portion of said housing in hinged relationship with a first wall thereof and movable between a closed position in which said platen extends at least partially across said open end portion and an open position; heating means associated with said platen member for heating at least a portion of the surface thereof; a front cover member mounted at said open end portion of said housing in hinged relationship with a second wall thereof opposite said first wall, said front cover member being movable between a closed position in which it extends at least partially across said open end portion of said housing adjacent said platen member and an open position; drive means including a drive capstan roller mounted on said first wall of said housing adjacent said open end portion and extending transversely across said first wall; and an idler roller mounted on said front cover member adjacent the free edge thereof and extending transversly thereacross in a position to engage said drive capstan roller when said cover is moved to its closed position, so that the sensitized paper may be drawn by said drive means up over the free edge of said platen and down across the surface of said platen and between said drive capstan roller and idler roller when said platen and cover members are in their closed positions.

2. An instrument for recording displayed characters including: a housing having a top wall, a bottom wall and an open end portion; means within said housing for receiving a cartridge of sensitized paper; a platen member; means mounted on said bottom wall of said housing adjacent said open end portion for supporting said platen member in hinged relationship therewith, said platen member being movable between a closed position in which it extends across said open end portion and an open position; heating means mounted in said platen member for heating at least a portion of the front surface thereof facing said open end portion; a front cover member; means mounted on said top wall of said housing adjacent said open end portion for supporting said cover member in hinged relationship with said top wall, said cover mem-

ber being movable between a closed position in which it extends across said open end portion and an open position; drive means including a drive capstan roller mounted on said bottom wall of said housing adjacent said open end portion and extending transversely thereacross; and an idler roller mounted on said front cover member adjacent the lower edge thereof and extending thereacross in position to engage said capstan roller when said cover member is moved to its closed position, so that the sensitized paper from said cartridge may be drawn by said drive means up over the top edge of said platen and down across said front surface thereof and between said capstan roller and idler roller when said platen and cover members are in their closed positions.

3. The instrument defined in claim 2 in which said idler roller is spring-loaded to bias the same against said drive capstan roller.

4. The instrument defined in claim 2 and in which a portion of the rear surface of said platen is positioned to receive images of the displayed characters when the platen is in its closed position, and which includes guide means for directing the sensitized paper across said portion of the rear surface of said platen as the paper is drawn through the instrument by said drive means.

5. The instrument defined in claim 1 in which at least a portion of said cover member is transparent to permit viewing of the developed sensitized paper as it is drawn across the front surface of said platen by said drive means.

6. The instrument defined in claim 2 in which said cover member defines a slot with said bottom wall when said cover member is in its closed position, said slot providing an exit for the sensitized paper.

7. An instrument for recording displayed characters including: a housing having an open end portion; means within said housing for receiving a flexible strip recording medium; a platen mounted at said open end portion of said housing in hinged relationship with a first wall thereof and movable between a closed position in which said platen extends at least partially across said open end portion and an open position; a front cover member mounted at said open end portion of said housing in hinged relationship with a second wall thereof opposite said first wall, said front cover member being movable between a closed position in which it extends at least partially across said open end portion of said housing adjacent said platen member and an open position; drive means including a drive capstan roller mounted on said first wall of said housing adjacent said open end portion and extending

transversely across said first wall; and an idler roller mounted on said front cover member adjacent the free edge thereof and extending transversely thereacross in a position to engage said drive capstan roller when said cover is moved to its closed position, so that the recording medium may be drawn by said drive means up over the free edge of said platen and down across the surface of said platen and between said drive capstan roller and idler roller when said platen and coupler members are in their closed positions.

8. An instrument for recording displayed characters including: a housing having a top wall, a bottom wall and an open end portion; means within said housing for receiving a flexible strip recording medium; a platen member having a portion of the rear surface thereof positioned to receive images of the displayed characters when the platen is in its closed position; means mounted on said bottom wall of said housing adjacent said open end portion for supporting said platen member in hinged relationship therewith, said platen member being movable between a closed position in which it extends across said open end portion and an open position; a front cover member; means mounted on said top wall of said housing adjacent said open end portion for supporting said cover member in hinged relationship with said top wall, said cover member being movable between a closed position in which it extends across said open end portion and an open position; drive means including a drive capstan roller mounted on said bottom wall of said housing adjacent said open end portion and extending transversely thereacross; an idler roller mounted on said front cover member adjacent the lower edge thereof and extending thereacross in position to engage said capstan roller when said cover member is moved to its closed position, so that the recording medium may be drawn by said drive means up over the top edge of said platen and down across the front surface thereof and between said capstan roller and idler roller when said platen and cover members are in their closed positions; and guide means for directing the recording medium across said portion of said rear surface of said platen as the recording medium is drawn through the instrument by said drive means.

References Cited in the file of this patent

UNITED STATES PATENTS

2,854,905	Land	Oct. 7, 1958
2,906,182	Booth et al.	Sept. 29, 1959
3,060,828	Ackermann	Oct. 30, 1962