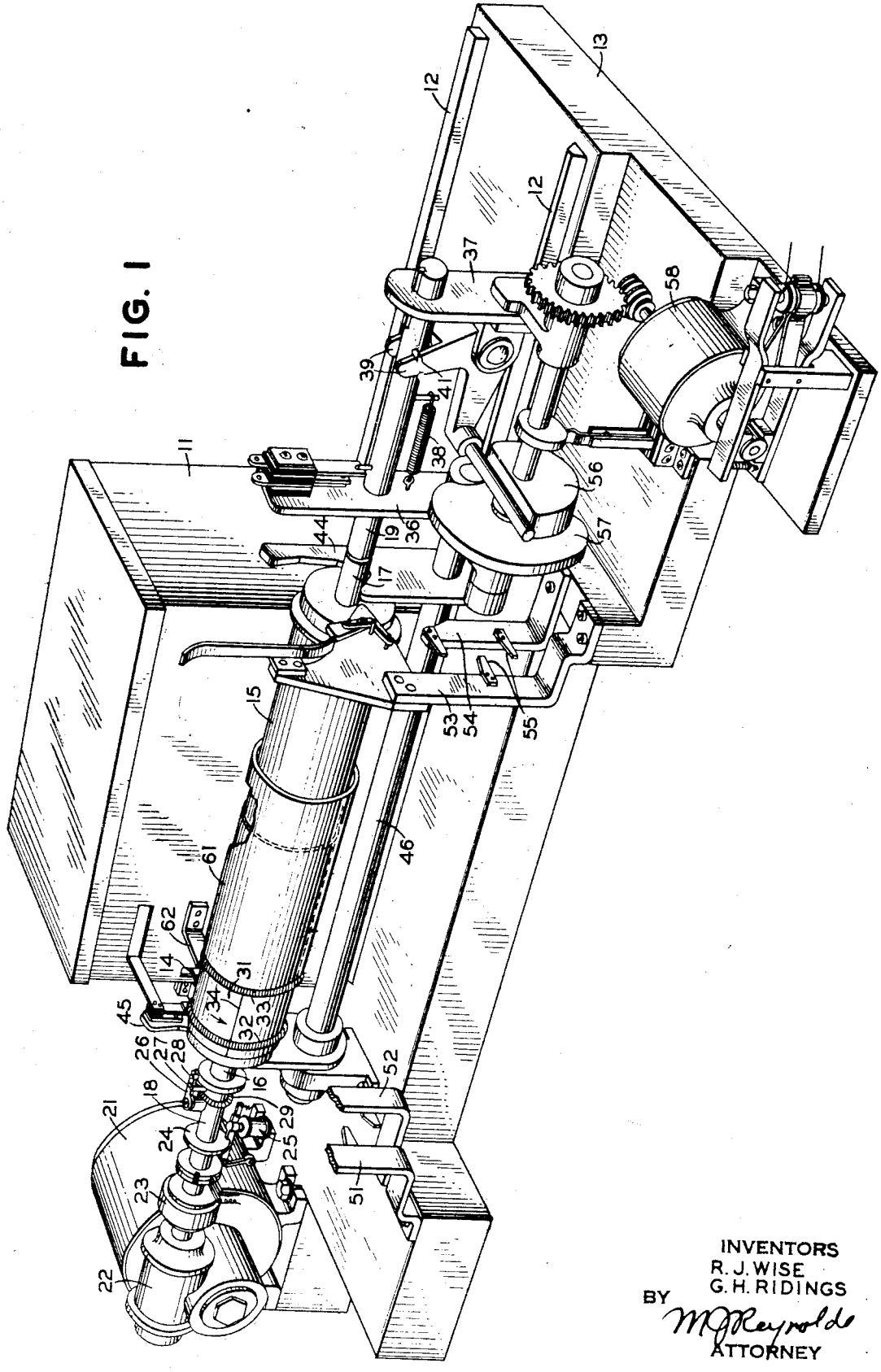
Dec. 14, 1943. R. J. WISE ET AL 2,336,909

FACSIMILE RECORDER

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FIG. 1



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FIG. 2

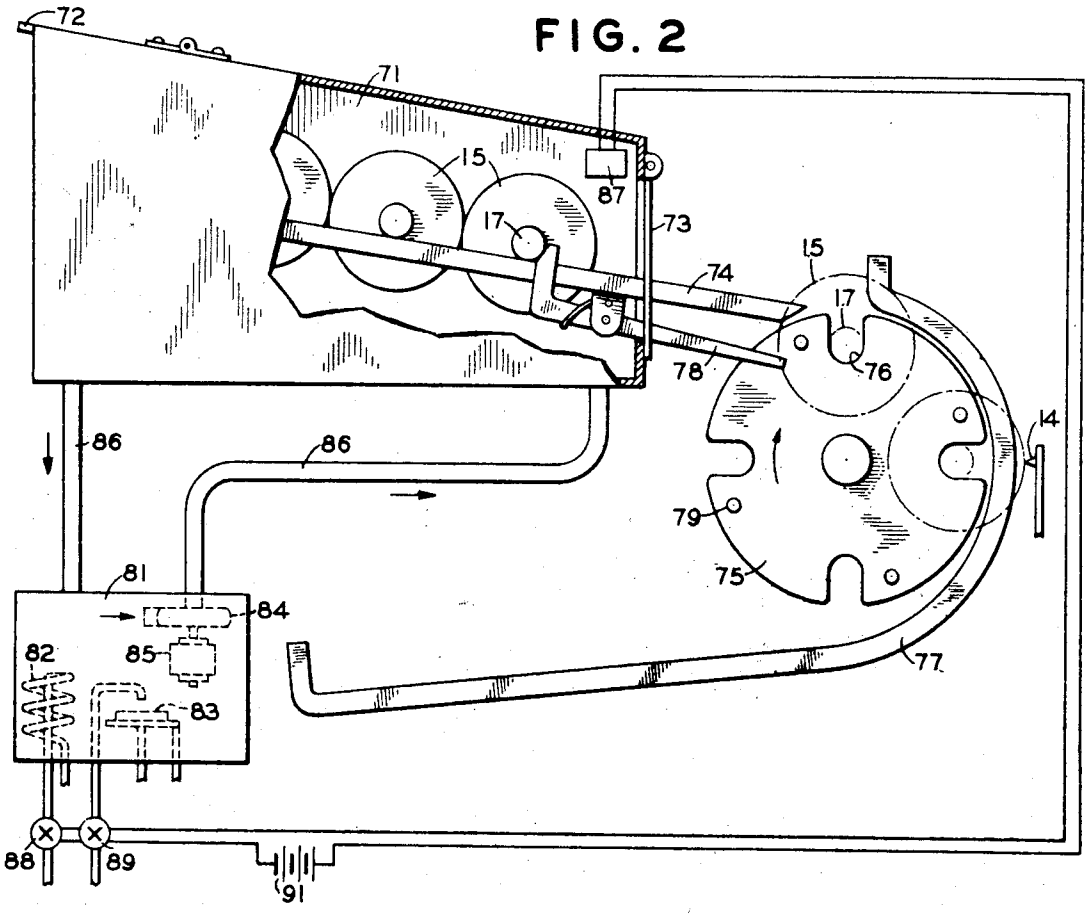
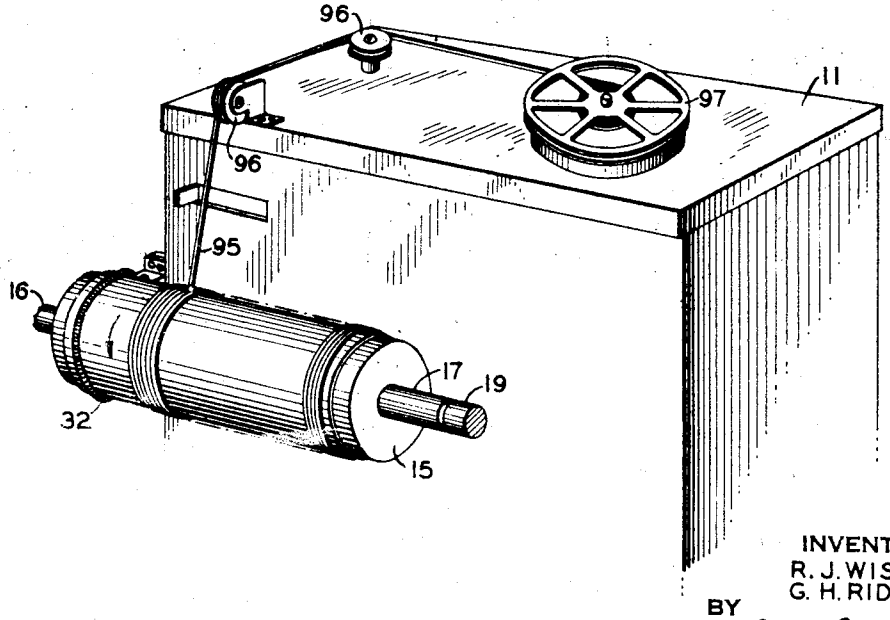


FIG. 3



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FACSIMILE RECORDER

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Application August 29, 1941, Serial No. 408,780

13 Claims. (Cl. 234—59)

This invention relates to facsimile telegraphy and more particularly to electrical recording on blanks formed of paper or other material which must be maintained at a fairly definite degree of humidity for satisfactory recording.

The present invention is concerned with a sheet of paper or other fibrous material prepared in any suitable manner by the application of a substance which becomes conductive when moistened. Examples of such substances are ammonium nitrate, ammonium sulphate, sodium nitrate, and nickel sulphate. The paper impregnated with such substances becomes conductive when the blank is subjected to moist atmosphere thereby permitting current to pass through the blank for the purpose of recording thereon. The marking material may be impregnated in the blank or may be applied as a coating over the blank. Examples of various coating materials are lead thiosulphate, titanium dioxide, and mercuric sulphide. In Patent No. 2,225,247, granted December 17, 1940, there is disclosed apparatus suitable for moistening such a blank prior to recording thereon. However, in the use of such blanks the exposure of the blank to the atmosphere during the recording operation or while awaiting the recording operation, causes it to rapidly lose its moisture content so that at the time recording is commenced or before it is completed, the blank may become sufficiently dry to preclude proper passage of current therethrough or its conductivity may vary to such extent that the successive blanks or successive portions of the same blank have different electrical characteristics, thus causing a variation in the recording between the successive blanks or successive portions of the same blank.

An object of this invention is to provide protective means for the blank to prevent the drying out thereof prior to or during the recording operation so that the complete recording operation can be properly done irrespective of the relative humidity of the surrounding atmosphere.

A further object is to provide a machine for conditioning recording blanks and automatically delivering them to a telegraph recorder without sufficient exposure thereof to the atmosphere to permit any substantial change in the electrical conductivity of the blanks.

A still further object is to provide an improved method of treating telegraph recording blanks of the type set forth to prevent premature drying thereof during a recording operation.

These and other objects, which will be apparent to those skilled in the art, are accomplished by the present invention, preferred embodiments of which are illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of a telegraph recorder constructed in accordance with one embodiment of this invention, arranged for hand feeding;

Fig. 2 is an elevation of an automatic feeding device comprising a humidifying magazine and an automatic feed for presenting the humidified blanks to the scanning mechanism; and

Fig. 3 is a perspective view showing a modified arrangement.

In the present invention, the blank of recording material is placed in a preconditioning or humidifying cabinet or the like until it has acquired the desired conductivity. It is then covered in such a way as to be protected against drying in the atmosphere. During the recording operation the blank is progressively exposed just ahead of the stylus so that the actual recording operation is carried out from beginning to end on material of the correct moisture content.

The present invention is illustrated in connection with a facsimile telegraph recorder of the type shown in the application of Wise et al., Serial No. 110,760, filed November 11, 1936, for System and apparatus for facsimile telegraphy, now Patent No. 2,255,868, granted September 16, 1941, although it will be apparent that it is equally well adapted to other machines.

This machine comprises a scanning carriage 11 (Fig. 1) slidable along guide rails 12 on a bed 13. A recording stylus 14 is mounted on the carriage for movement therewith longitudinally of a recording cylinder 15, the latter having axial arbors 16 and 17 by which it is mounted for rotation between centering spindles 18 and 19. As described in said Patent No. 2,255,868, the driving spindle 18 is rotated by an electric motor 21 through reduction gearing 22 and friction clutch 23, controlled by a notched stop disc 24 under the control of a framing or phasing magnet 25. An arm 26 is pivoted on the spindle 18 and extends in the direction of the cylinder to engage a pin 27 projecting radially from the spindle and also a pin 28 extending radially from the arbor 16. The arm 26 is urged into engagement with the pins by a spring 29 one end of which is attached to the arm and the other end to the spindle 18. By this means the recording cylinder 15 is rotated by rotation of the spindle 18.

The recording blank 31 is wrapped around the

recording cylinder 15 and is secured thereon by any suitable means such as a pair of elastic rings 32, 33, the inner ring being movable along the blank and cylinder. The blank is mounted on the cylinder so that the lap 34 of the edges invariably bears a definite relation to the notch in the disc 20 for the purpose of obtaining the desired phasing with an associated transmitter (not shown) as will be understood by those skilled in the art and as is more fully described in the aforesaid Patent No. 2,255,868.

The centering spindle 19 is longitudinally movable in supporting brackets 36 and 37, a coil spring 38 tending to hold the spindle in cylinder supporting position. Any suitable means such as a yoke 39 engaging pins 41 on the spindle can be employed for retracting it to permit changing recording cylinders at the end of a recording operation. Retraction of the spindle 19 releases the cylinder, permitting it to drop slightly onto a cradle formed by grooves in a pair of members 44 and 45 mounted on a rocker shaft 46 journaled in any convenient bearings. After retraction of the spindle 19 the cradle members can be rocked outwardly to deposit the cylinder with its arbor 18 received between guides 51, 52 and arbor 19 between guides 53, 54. The staggered lugs 55 on the guides permit the cylinder to drop slowly by gravity through the guides and to be collected by hand. The yoke 39 and shaft 46 may be actuated by cams 56 and 57, respectively driven by an electric motor 58, as fully set forth in the aforementioned Patent No. 2,255,868.

The scanning carriage 11 is moved longitudinally of the cylinder during recording, in the well known manner, by suitable mechanism not shown herein, but fully described in said Patent No. 2,255,868.

In the present invention means is provided for preventing premature drying of the humidified recording blank 31 during the recording operation. As illustrated in Fig. 1, the cylinder is about double the length of the blank of recording material and a cover or seal is provided in the form of a sleeve or tube 61 which is slidable over the blank 31 to substantially entirely cover it and seal it against the atmosphere. In positioning the sleeve over the blank the two elastic ring fasteners 32 and 33 are pushed together at the end of the cylinder and the sleeve moved to abut against the ring 33. A finger 62 projecting outwardly from the carriage 11 has its end located between the two elastic rings.

The finger 62 is positioned adjacent the recording stylus 14. Hence, during recording, as the carriage 11 is moved longitudinally along the rotating cylinder and the cylinder 15 is rotated by the motor 21, the finger 62 moves the elastic ring 33 and abutting sleeve 61 longitudinally to progressively uncover the blank 31 of recording material in advance of the stylus as it moves therealong.

In Fig. 2 is shown a mechanism for automatically feeding successive cylinders 15 with the blanks and covers thereon to the scanning mechanism. As illustrated, this includes a conditioning or humidifying cabinet 71 having a hinged lid 72 and swinging door 73. A pair of cylinder supporting guide rails 74, only one of which is shown, extends throughout the length of the cabinet and projects outwardly through the door 73 to a point adjacent the tops of a pair of rotary cradle members 75, only one of which is shown. The cradle members have peripheral recesses 76 for receiving the arbors 16 and 17 of the recording cylinders 15.

As described in said Patent No. 2,255,868 the cradle members are intermittently rotated to successively place the recording cylinders in recording position to be engaged by the supporting centers 18 and 19 with the recording blank in contact with the stylus 14 as shown in Fig. 2. At the end of a recording operation the cradle is rotated automatically after freeing the arbors from the supporting centers to move a fresh cylinder into position and discharge the one bearing the recorded message. A second pair of rails 77, only one of which is shown, partially embraces each cradle member 75 to retain the cylinders therein during movement into recording position, and provide supports for receiving the cylinders after recording.

A pivoted latch 78 is positioned adjacent to one of the rails 74 in the path of the cylinders in the conditioning chamber 71 to hold the cylinders therein. Pins 79 are suitably located on one of the cradle members 75 for engaging an arm of the latch at the proper time when the cradle member is rotated, to trip the latch and release a single cylinder for delivery by gravity to the cradle members.

The temperature and relative humidity of the atmosphere in the cabinet 71 is determined by suitable air conditioning equipment 81 which may include a cooling coil 82 and humidifier 83 supplied with water from any convenient source (not shown). An air pump 84 driven by an electric motor 85 circulates air from the equipment housing through the cabinet 71 by means of ducts 86. A combined humidostat and thermostat 87, or any other suitable control, can be employed to operate cooling and moisture control valves 88 and 89, respectively, from a current source 91, to regulate the condition of the atmosphere in the preconditioning cabinet 71.

The cylinders 15 within the humidifying chamber 71 are substantially twice the length of the blank and the latter is applied thereto adjacent one end, in the same manner as shown in Fig. 1. The tubular protecting member 61 is positioned at the opposite end of the cylinder so that the blank is freely exposed to the humid atmosphere within the chamber. Upon operation of the latch 78 the cylinder, as stated, rolls down the rail 74 into the cradles 75 at the uppermost position thereof and then awaits the recording from the preceding cylinder which is now in recording position. At the time the cylinder leaves the humidifying chamber and moves onto the cradle member 75, the operator slides the tubular sleeve over the humidified message and thereby protects it from dehumidification during the time it is awaiting advancement to the recording position. During recording the tubular sleeve is moved off of the blank by the arm 62 as shown in Fig. 1, just preceding the stylus.

In Fig. 3 is shown a modified form of cover or seal for the recording blank. As illustrated, it comprises a narrow ribbon or tape 95 such, for example, as a Cellophane tape wrapped around the cylinder so as to enclose the blank of recording material. The tape should be wound at a pitch corresponding to the number of lines scanned by the stylus per linear inch so that it can be unwound to progressively uncover the recording material at the same rate as that at which the stylus scans. If, for example, the stylus scans one hundred lines to the linear inch, the tape should be wrapped with a one hundred

line pitch, or a pitch of 1/100 inch, and in a direction permitting unwrapping as the cylinders rotates.

To unwrap, after the cylinder is in position, the end of the tape is passed over guide pulleys 96, or the like, on the scanning carriage, and connected to a spring pulley or reel 97, whereby the tape will be unwound and taken up by the reel as the cylinder rotates during scanning, thus progressively uncovering the recording material in advance of the stylus.

In operation, referring to Fig. 1, when the recording cylinder is positioned on the supporting centers 18, 19 in recording position, the elastic ring 33 and sleeve 61 are moved slightly away from the ring 32 to expose a part of the recording material to the stylus and to position the finger 62 against the ring 33. As the scanning operation proceeds the finger moves the ring and sleeve longitudinally of the cylinder to progressively uncover the recording material ahead of the stylus. The ring 33 being near the stylus holds the recording material tightly against the cylinder at the point of recording. The cylinder 15 is of such length that the sleeve 61 can be moved sufficiently to completely uncover the blank if necessary. At the end of the recording operation the cylinder is removed and a fresh one substituted.

The operation of the modification illustrated in Fig. 3 is obvious. In this case a relatively shorter cylinder, approximating in length that of the blank, can be employed.

For automatic cylinder feeding the arrangement shown in Fig. 2 can be employed.

It will be understood that many modifications and changes can be made in the structure shown without departing from the essential attributes of the invention, and all such changes are contemplated as coming within the scope of the appended claims.

What is claimed is:

1. A facsimile telegraph machine comprising a support for a blank of recording material, a stylus for recording on a blank on said support means for covering said blank while it is in scanning position on said support to prevent deterioration thereof, and means for moving said covering means during scanning operations to permit said stylus to record on the blank.

2. A facsimile telegraph machine comprising a recording cylinder adapted to support a blank of humidified recording material, a stylus for recording on a blank on said cylinder, a cover for said blank while it is in scanning position on said cylinder to prevent drying thereof, and means for removing said cover during scanning operations to permit said stylus to record thereon.

3. A facsimile telegraph machine comprising a support for a blank of humidified material for recording on a blank on said support, a recording stylus, means for covering said blank while it is in scanning position on said support to prevent drying thereof, and means for progressively moving said covering means to uncover said blank during the recording operation to permit said stylus to record thereon.

4. A facsimile telegraph machine comprising a support for a blank of humidified recording material, a recording stylus, means for moving said stylus relatively to a blank on said support for recording thereon, means for covering said blank on said support prior to recording to prevent drying thereof, and means for moving said covering means to uncover said blank during recording to permit said stylus to record thereon.

5. A facsimile telegraph machine comprising a recording cylinder adapted to support a blank of humidified recording material, a recording stylus, means for moving said stylus relatively to a blank on said cylinder for recording thereon, means covering a blank on said cylinder to prevent drying thereof prior to recording, and means movable simultaneously with said stylus relatively to said cylinder for progressively moving said covering means to uncover said blank in advance of said stylus to permit said stylus to record thereon.

6. A facsimile telegraph machine comprising a recording cylinder adapted to support a blank of recording material, a sleeve slidable on said cylinder and adapted to cover a recording blank thereon, a recording stylus movable relatively to said cylinder for recording on a blank, and means for moving said sleeve longitudinally of said cylinder to progressively uncover a blank during a recording operation.

7. A facsimile telegraph machine comprising a recording cylinder adapted to support a blank of recording material, a sleeve slidable on said cylinder for covering a blank thereon, a scanning carriage movable relatively to said cylinder, a recording stylus mounted on said carriage and movable therewith for recording on said blank, means for moving said carriage and stylus longitudinlly of said cylinder, and means actuated by movement of said carriage for sliding said sleeve longitudinally of said cylinder to progressively uncover a blank thereon in advance of said stylus.

8. A facsimile telegraph machine comprising a recording cylinder adapted to support a blank of humidified recording material, a recording stylus, a cover for a blank on said cylinder to prevent drying thereof comprising a strip wrapped spirally around said blank, and means for unwinding said strip to progressively uncover said blank and permit said stylus to record thereon.

9. A facsimile telegraph machine comprising a recording cylinder adapted to support a blank of humidified recording material, a recording stylus, a cover for a blank on said cylinder to prevent drying thereof comprising a strip wrapped spirally around said blank, means for rotating said cylinder during recording, and means operated by rotation thereof for unwinding said strip to progressively uncover said blank and permit said stylus to record thereon.

10. A facsimile telegraph machine comprising a recording cylinder adapted to support a blank of humidified recording material, a recording stylus, a cover for a blank on said cylinder to prevent drying thereof comprising a strip wrapped spirally around said blank, means for rotating said cylinder during recording, and means operated by rotation thereof for unwinding said strip to progressively uncover said blank and permit said stylus to record thereon comprising a spring pulley connected to said strip.

11. The combination in a device for supporting a blank of recording material in a telegraph recorder, of a support for said material, and means on said support for covering said material so as to prevent deterioration of the recording properties of said material, said means being movable on said support to uncover said material for recording.

12. A device for supporting a blank of recording material in a telegraph recorder comprising a cylinder adapted to have said material wrapped

around it, and a sleeve slidably mounted on said cylinder to cover said material thereon so as to prevent deterioration of the recording properties of said material, said sleeve being movable longitudinally of said cylinder to uncover said material for recording purposes.

13. A device for supporting a blank of recording material in a telegraph recorder comprising a cylinder adapted to have said material wrapped around it, a sleeve slidably mounted on said cylinder to cover said material thereon so as to prevent deterioration of the recording properties of said material, said cylinder being sufficiently long to permit said sleeve to be moved longitudinally to uncover said material for recording purposes.

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