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FACSIMILE RECORDER

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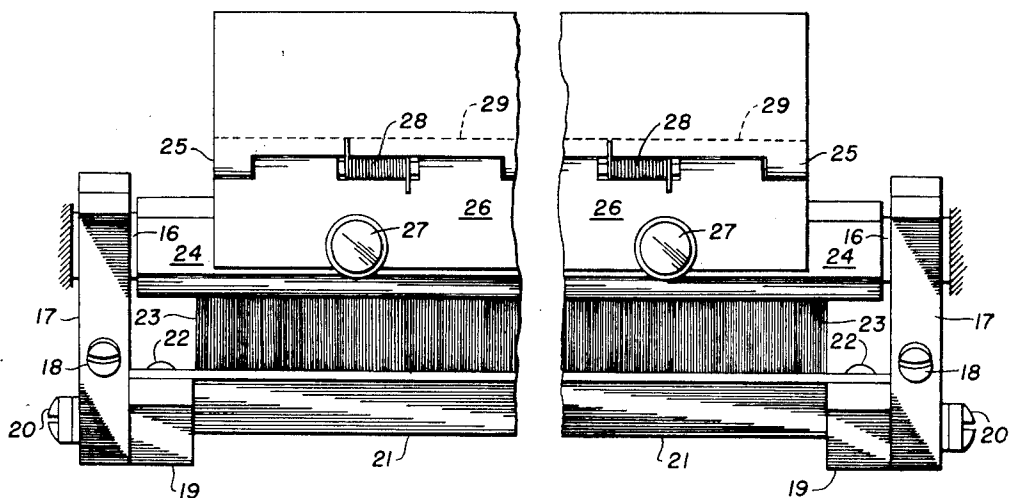


Figure 2

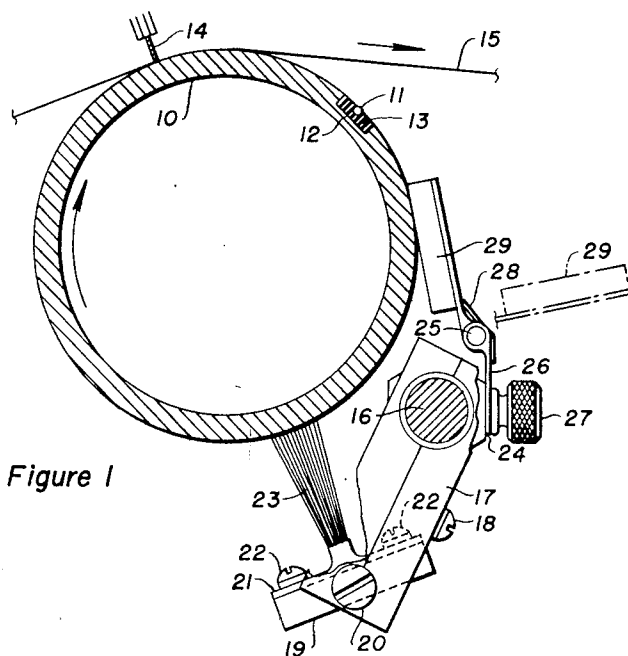


Figure 1

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FACSIMILE RECORDER

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6 Claims. (Cl. 346—101)

The present invention relates in general to facsimile recorders of the type employing the so-called "lawnmower" electrode system in which an electrosensitive recording medium is passed between a substantially stationary linear electrode or printer blade and a cooperating rotating helical electrode for purposes of effecting marking of the recording medium in response to signal intelligence transmitted to the printer blade from a suitable transmitting scanner. More particularly, the invention contemplates the provision of means for overcoming "blocking" of the helix and printer blade as often occurs in facsimile equipment utilizing this type of electrode system.

In facsimile recorders of the general class described, it often occurs that the scraping or "squeegee" action of the linear and helical electrodes against the recording paper passing therebetween causes paper fibers to become dislodged or torn from the recording paper. The various chemicals used in impregnating the recording paper to render it responsive to electric currents sometime form minute crystalline deposits either following impregnation or during electrolysis, which tend to remain close to the surface of the paper and are also dislodged by the scraping action of the printer blade and helix. In addition, certain impregnating compositions have a tendency to form decomposition products during electrolysis and a small portion of this matter is scraped from the paper carrier during the printing operation. These foreign substances tend to adhere to the helical electrode carried by the recorder drum, and, over a relatively short period of time, they effect at least partial insulation of the electrode system with resulting loss of definition within the printed copy. This insulating phenomenon is termed "blocking" and methods and apparatus directed towards overcoming or mitigating the resulting interference caused by the insulating particles are referred to as "anti-blocking" measures.

In the past, a number of anti-blocking measures have been proposed, including, among others, (1) the addition of water-soluble, wax-like substances to the impregnating solution in an effort to provide a polished or smooth surface on the recording paper thereby minimizing the possibility of particles of paper or chemicals being dislodged from the paper, and (2) the use of a brush or scraper mounted so as to engage the surface of the recorder drum as it revolves and intended to sweep away foreign substances adhering to the helical electrode carried thereon. Neither of the aforementioned measures provides entirely satisfactory results, in that, the wax-like addition agents tend to reduce the conductivity of the recording paper, and, unless the moisture content of the paper carrier is carefully regulated within relatively close tolerances, the anti-blocking agents themselves precipitate on the surface of the paper and actually add to the blocking action, with respect to both the linear and helical electrodes. The use of a brush customarily requires, in accordance with known teachings, mounting of the helix on the recorder

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drum in a raised or elevated position with respect to the surface of the drum with the result that matter swept from the helix simply tends to accumulate and build up against the side of the helix facing away from the direction of rotation of the drum. On the other hand, if the helix is mounted in a position substantially level or partially recessed with respect to the surface of the recorder drum, the cleaning brush is equally ineffective in clearing the helix of blocking substances. Apparently, the interfering particles or blocking agents acquire static charges and stubbornly resist complete removal under action of the brush or scraper mechanisms.

The principal object of the present invention is to provide a highly effective anti-blocking device which overcomes the inherent disadvantages of known anti-blocking expedients and which can be used without altering the composition of otherwise operative electrolytic recording papers, and without alteration of the preferred form of surface-mounted helical electrode as used within most recorders employing the lawnmower type electrode system.

The anti-blocking device of the invention comprises, in combination, a brush and wick assembly positioned to engage the rotating recorder drum carrying the helical electrode; the wick functioning to continuously supply to the surface of the drum a lubricating fluid capable of functioning as an anti-static agent; and the brush functioning to disperse the fluid in a thin, even coat over the entire surface of the drum and helix, and, to dislodge and remove from the helix and surrounding drum surface blocking substances of the type hereinbefore described.

The invention may be best understood by reference to the following description taken in conjunction with the accompanying drawings wherein:

Fig. 1 is an end view, partly in section, of a facsimile recording drum with the anti-blocking brush and wick assembly shown in operative relationship with respect thereto; and

Fig. 2 is a broken elevational view of the brush and wick assembly only, as illustrated in Fig. 1.

With reference to Fig. 1, there is illustrated in cross section, a conventional facsimile recording drum 10 which is geared to a prime mover (not shown) for rotation in the direction of the curved arrow. Drum 10 carries a continuous electrode element 11 mounted in a single helical turn around the drum within a mounting channel 12 containing a rubber insert 13 or any similar resilient mounting base. Electrode 11 is anchored at the respective ends of drum 10 in conventional manner (not shown) which may include means for adjusting the tension of the helix. Reference numerals 14 and 15 illustrate, in schematic form only, a conventional stationary linear electrode or printer blade (14) and a sheet of electrosensitive recording paper (15). The recording paper is adapted to be moved progressively in the direction of the arrow and is passed over drum 10 carrying the helical electrode and under the stationary linear electrode 14. Rotation of drum 10 at a predetermined and controlled rate of speed causes a minute recording area, formed at the intersection of printer blade 14 with helical electrode 11 to travel successively across the recording sheet from left to right in lines successively displaced from the top to the bottom of the sheet. Recording current is applied between electrodes 11 and 14 for effecting marking of the sheet. All of the foregoing expedients are well known in the art; the basic arrangement constituting the so-called "lawnmower" system of recording.

In accordance with my invention, I provide a suitable supporting rod 16 extending between the sides of the frame (not shown) of a facsimile recorder as best seen by reference to Fig. 2, and positioned closely adjacent to recording drum 10 at the lower rear quadrant thereof.

Mounted around rod 16 at each end thereof, I provide identical brush clamps 17, each formed in two sections for ease of adjustment and clamped in position on rod 16 by means of bolts or screws 18. A brush pivot block 19 is adjustably mounted to each of the brush clamps 17 by means of pivot bolts or screws 20, such that the pivot blocks and brush assembly carried thereon may be rotated or pivoted on brush clamps 17 to any desired position and secured against further movement by tightening screws 20. To the brush pivot blocks 19, I secure a brush holder 21 by means of screws 22. Brush holder 21 carries a brush 23 formed of nylon bristles or any other suitable material which contacts the surface of drum 10 along the entire length of the drum and preferably extending slightly beyond the drum at each end thereof.

Supporting rod 16 is provided, over at least that portion of its length corresponding to the span of drum 10, with a flat mounting surface 24 which may be provided conveniently by forming the rod in hexagonal, triangular, rectangular or square cross-section intermediate its ends. To surface 24, I mount the wick assembly of the invention, consisting of a piano-type strap hinge 25 having one arm 26 adjustably mounted on surface 24 by means of knurled set screws 27, and the other arm spring-urged inwardly against the surface of drum 10 by means of springs 28, and carrying thereon a substantially rectangular wick 29 of felt or similar absorbent material. Wick 29 extends along substantially the entire surface of drum 10 and is preferably terminated just short of the ends of the drum. Arm 26 of assembly 25 preferably is provided with elongated or slotted T holes through which set screws 27 pass, such that the entire wick assembly may be adjusted upwardly and centered with respect to the drum, or removed entirely for cleaning purposes by a simple adjustment of set screws 27.

In operation, the wick assembly is opened outwardly periodically, as indicated by the dotted lines in Fig. 1, and is impregnated with a lubricating or "deblocking" fluid of the type hereinafter described. In its operational position, wick 29 functions as a reservoir for the deblocking fluid and serves to continuously supply a thin film of the fluid to the recording drum and helix. In practice, I have found that the brush and wick assembly of the invention will function to completely eliminate blocking without need of refilling the wick for periods ranging from several days to a week depending upon atmospheric conditions, although it is recommended that a supply of fluid be added to the wick as a daily maintenance measure to avoid unnecessary service difficulties arising by reason of the inability of inexperienced operators to recognize impairment of copy caused solely by blocking effects.

Apart from the anti-static or deblocking characteristics of fluid used with the wick assembly of the invention, it is important that the fluid be substantially non-insulating such that the thin film deposited on the helical electrode will not interfere with the recording process. In addition, the fluid should be substantially colorless so as not to cause staining of the record sheet during printing and it should be of relatively stable composition in order to avoid discoloration or yellowing of printed copy upon storage. Of particular importance, the fluid should have a relatively slow rate of evaporation.

It has been found that a solution containing equal parts by weight of water, glycerine and a water-soluble Car-

bowax (tradename), provides excellent results when used in conjunction with the brush and wick assembly of the invention. The composition of the deblocking fluid may, of course, be varied in accordance with the particular type of electrolytic recording paper employed and the foregoing composition was determined on the basis of paper prepared in accordance with impregnating solutions of the type described in copending application Serial No. 33,344 of Maximilian Stand, entitled, "Electrolytic Recording Paper," which was filed on January 26, 1953.

While I have described above the principles of my invention in connection with a specific embodiment thereof, it is to be clearly understood that this description is made only by way of illustration and not as any limitation with respect to the true scope of my invention.

I claim:

1. In a facsimile recorder of the type employing a stationary linear electrode and a cooperating rotating helical electrode, the anti-blocking device which comprises a cleaning brush mounted adjacent the helical electrode in sweeping contact therewith, and a wick impregnated with a substantially non insulating lubricating fluid mounted in contact with the helical electrode and adapted to continuously supply a thin film of said lubricating fluid to said electrode.

2. In a facsimile recorder of the type employing a stationary linear electrode and a cooperating helical electrode mounted on a rotating drum, the anti-blocking device which comprises a linear cleaning brush mounted adjacent the rotating drum in sweeping contact with the surface of the drum along the entire length thereof, and a linear wick element mounted adjacent the drum and spring-urged into contact with the surface of the drum along substantially the entire length thereof, said wick being impregnated with a substantially non-insulating lubricating fluid and functioning to continuously supply a thin film of the lubricating fluid to the surface of the drum and the helical electrode carried thereon upon rotation of the drum.

3. The anti-blocking device as claimed in claim 2 and further comprising means for exposing said wick element for re-impregnation of the same.

4. The anti-blocking device as claimed in claim 2 and further comprising means for adjusting the position of said wick element with respect to the rotating drum.

5. The anti-blocking device as claimed in claim 2 and further comprising means for adjusting the position of said cleaning brush with respect to the rotating drum.

6. An anti-blocking device for use with facsimile recorders of the type employing a stationary linear electrode and a cooperating rotating helical electrode, comprising a cleaning brush mounted to contact successive portions of the helical electrode upon rotation of the same, and a wick element impregnated with a substantially non insulating lubricating fluid mounted to contact successive portions of the helical electrode upon rotation of the same and adapted to continuously supply thereto a thin film of said lubricating fluid.

References Cited in the file of this patent

UNITED STATES PATENTS

2,444,484	Wise et al.	July 6, 1948
2,462,145	Thomas	Feb. 22, 1949
2,591,640	Tribble	Apr. 1, 1952