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P. L. GRAFSTEIN ET AL

2,513,409

FACSIMILE RECORDER DRUM

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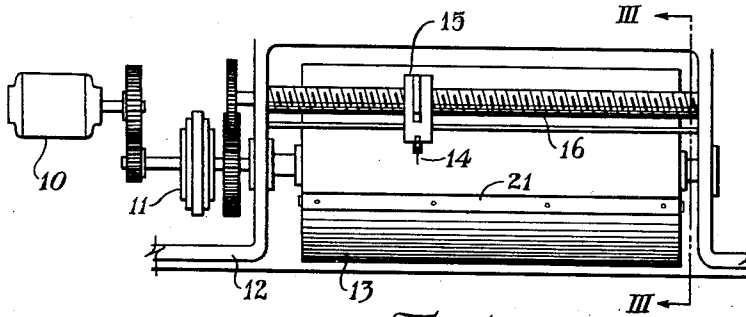


Fig. 1

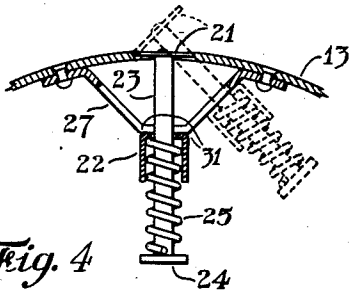


Fig. 4

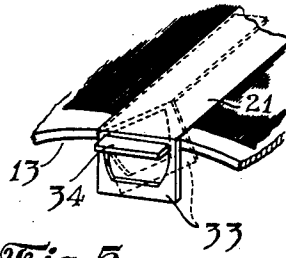


Fig. 5

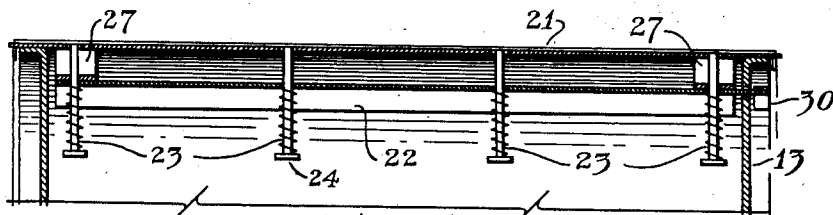


Fig. 2

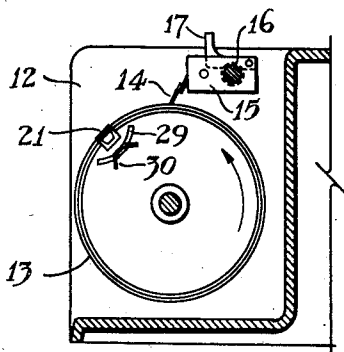


Fig. 3

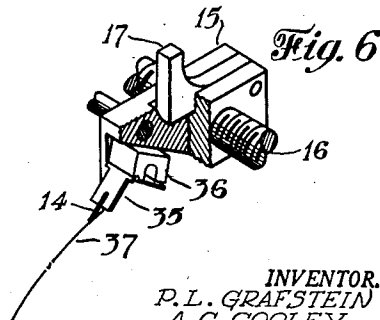


Fig. 6

INVENTOR.
P. L. GRAFSTEIN &
A. G. COOLEY

BY

E. R. Evans
ATTORNEY

UNITED STATES PATENT OFFICE

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FACSIMILE RECORDER DRUM

Paul L. Grafstein, Brooklyn, and Austin G. Cooley, New York, N. Y., assignors to Times Facsimile Corporation, New York, N. Y., a corporation of New York

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2 Claims. (Cl. 346—138)

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This invention relates to a drum or sheet holder for facsimile equipment, and more particularly to clamping devices for holding the edges of a sheet on a drum or other support.

In facsimile equipment used for the copying, transmission or recording of pictures and messages, a revolving drum driven at synchronous speed is often employed in both the transmitter and recorder for supporting the copy and the recording sheet, respectively. In the transmitter it is important to hold the picture or message copy securely on the drum and closely in contact with the surface of the drum. The sheet should be held in such a manner that it does not either slip or bulge so that it is out of focus with the transmitting optical system. Similarly, on the recording equipment, the recording film or paper must be held securely and tightly against the surface of the supporting drum. In addition, it is important that the sheet-holding means be easy to adjust or operate.

Where a clamp bar is used on a recording drum employed for electric current recording, the clamp bar must lie flush with the surface of the drum and be quite thin at its leading edge so that the recording stylus can ride freely over the clamp bar without undue bouncing and without injuring the stylus. This was so difficult of accomplishment that for many years other clamping means, such as spring bands encircling the drum, have been used for stylus recording equipment although much less satisfactory from the standpoint of security or holding effectiveness and ease of operation.

In general terms, it is the object of the invention to provide clamping means for a facsimile drum or the like which is more satisfactory and simpler to use than prior devices and which may be used in a transceiver or recorder employing a direct-recording stylus riding over the recording sheet.

For transmitters or photographic recorders, drum clamp bars extending along the length of the drum have been proposed which can be raised or tilted on either edge or which used separate clamps to clamp both ends of the sheet or the film to be secured to the drum. Since it is necessary to hold one edge of the sheet securely while the clamp bar is raised to facilitate the insertion and clamping of the other edge, these prior devices possessed certain drawbacks from a practical standpoint. Either they did not open up wide enough to permit easy insertion of the sheet or they protruded above the surface of the drum and therefore could not be used for stylus

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recording machines. Where separate clamping means was provided for each end of the sheet, the width of the sheet holder reduced the usable area of the drum to an undesirable extent.

Another object of the present invention is to overcome these disadvantages and provide a flush clamping bar of minimum width which is effective to hold either edge of the sheet securely when the clamp is opened for insertion of the other edge. This is particularly important in the case of the larger sizes of drums where, after preliminary mounting of the sheet, it is sometimes necessary to open up one or both sides of the paper clamp while pulling the sheet tight to eliminate wrinkles and bulges.

Another object of the invention is to provide a tilting clamp bar or sheet-holding element of the character described which is easier to operate than those used heretofore and which includes improved detent means to hold the same in the tilted or open position, releasing the hands for use in grasping the sheet or the controls of the machine.

Other objects and advantages of the invention will appear from the following detailed description of the preferred modification shown in the accompanying drawings. In the drawings:

Fig. 1 is a top plan view of a facsimile recorder embodying the invention.

Fig. 2 is a longitudinal sectional view to an enlarged scale through the drum clamp bar shown in Fig. 1.

Fig. 3 is a cross-sectional view taken on the line III—III of Fig. 1.

Figs. 4 and 5 are detail views to an enlarged scale of the drum clamp and its supporting structure, and

Fig. 6 is a detail view of the stylus holder.

Referring to Figs. 1 and 3, a facsimile recorder is shown embodying a conventional arrangement of motor 10, clutch 11 and supporting frame 12 for a rotating drum or cylindrical sheet holder 13. By way of example, the recorder is shown as provided with a recording stylus 14 carried by a stylus holder 15 which is actuated by a lead screw 16, whereby the stylus 14 is caused to traverse the length of the drum 13 as the recording sheet revolves on said drum. The threaded half-nut member 17 is pivoted on the holder 15 so that it can be manually disengaged from the lead screw 16. The sheet holder embodying the invention may also be used in connection with other facsimile recording or transmitting machines or, in fact, with any machines or apparatus wherein a sheet has to be supported substan-

tially in the same manner. However, it will be apparent that the use of the recording stylus 14 requires clamping means which is substantially flush with the drum so that the stylus will ride over the clamp bar and be maintained uniformly in contact with the sheet during substantially the entire rotation of the drum.

In accordance with the present invention, the recording sheet is securely mounted on the drum by clamping the same under the opposite edges of a thin elongated clamp bar 21 which extends the entire length of the drum 13 and which lies in a recess in the outer surface thereof, as shown. The clamp bar 21 is preferably made of strong elastic metal such as steel, Phosphor bronze or beryllium copper, but may be so thin that it is not stiff enough without reinforcement to retain its straightness along the linear drum surface, particularly in the case of a long drum. To provide the necessary stiffness and to enable the clamp bar 21 to be tilted for loading the drum, reinforcing means is provided in the form of a U-shaped channel bar 22 positioned parallel and in spaced relation to the clamp bar 21, as shown in Figs. 2 and 4. The operating and reinforcing bar 22, in the preferred form of the invention, is secured to the clamp bar 21 by a plurality of posts 23. The posts 23 are riveted or secured in any other desired manner to the clamp bar 21, and project through clearance holes or apertures in the drum and said bar 22. Each of said posts is provided at the inner end with a head 24, and a compression spring 25 is disposed between the head 24 and the channel bar 22. If desired, the head 24 may be adjustable for obtaining the proper tension in the coiled spring 25, as for example by threading the end of the post 23.

The channel bar 22 is required on a relatively long drum, ten inches or more in length. On a short drum, the bar may be omitted. In this case, short sections of channel or the like may serve as spring seats on the posts 23, between the ends of the springs 25 and the brackets 27.

As shown more clearly in Figs. 2 and 4, one or more angular slotted brackets 27 forming an inwardly projecting shoulder are provided, preferably one at each end of the drum. The posts 23 project through the brackets 27 whereby the channel bar 22 and the clamp bar 21 are guided by the slots in said bracket and thus held against longitudinal displacement on the drum. The location and configuration of the brackets 27 are such that the spring 25 surrounding each post 23 is compressed when the posts are pushed from the normal central position, so that the clamp bar 21 is normally held firmly in the position shown in full lines in Fig. 4.

In mounting a sheet on the drum 13, the clamp bar 21 is pivoted or tilted to the position shown in dotted lines in Fig. 4, to permit insertion of the edge of the sheet underneath the bar. This is done by rocking or pushing the reinforcing bar 22 to one side of its central normal position. As shown, the bar 22 projects through a slot 29 in one or both of the end bells of the drum 13 (see Figs. 2 and 3). A handle or thumb-piece 30 may be provided on the end of the bar 22 for raising the clamp bar 21. The brackets 27 are preferably formed with camming surfaces including angular shoulders or corners 31 constituting, in combination with the abutting portion of the bar 22 and spring 25, simple detent means for holding the clamp bar 21 in its central clamping position or in either of its tilted positions, one of which is shown in dotted lines in Fig. 4.

In accordance with a further feature of the invention, the clamp bar 21 is provided at each end with an apertured offset portion or member 33, shown more clearly in Fig. 5. A projecting lug 34 extends through the aperture in the member 33, the lug 34 at each end of the drum 13 being fixed to or integral with the drum. With this construction it will be apparent that as the posts 23 are tilted, the clamp bar 21 is tilted about one of the edges of the lug 34. Since the edges of the lug 34 which form pivots for the clamp bar 21 are substantially in alignment with the edges of the clamp bar which press against the sheet mounted on the drum, the sheet is held firmly at one end by the lower edge of the bar when it is tilted to raise the opposite edge of the bar. The aperture in the offset portion 33 of the clamp bar preferably is shaped to hold the clamp bar against one edge of the lug 34 as the opposite edge of the clamp bar is raised. While the lug 34 constrains the movement of the clamp bar 21 at its extreme ends during the loading operation, the lower edge of the tilted bar is also held in contact with the sheet along its entire length on account of the resilient means 25 acting on the bar along its length and tending to press the bar against the drum.

Fig. 6 illustrates a preferred form of stylus holder 15. As shown, the stylus 14 in the form of a thin wire or needle, is attached to the outer offset lug or ear 35 of a steel armature which is pivotally mounted on a small horse-shoe magnet 36. The line 37 represents the line of contact between the stylus 14 and the recording sheet, and it will be noted that the engagement of the point of the stylus with the sheet holds the rear free end of the armature from abutting against the magnet 36. Thus the stylus is held yieldingly in engagement with the sheet by the magnetic attraction of the armature 35, and wear of the stylus is taken up by the pivoted movement of the armature in relation to the pole faces of the magnet 36. To replace the stylus, the armature with its attached stylus point 14 is simply pulled off the magnet 36 and another armature and point slipped in place. No claims are made in the present application to this feature, which is disclosed and claimed in the co-pending application of A. G. Cooley, Ser. No. 787,779, filed November 24, 1947.

It will be apparent that the invention provides an improved clamping means for a drum or other sheet holder which is simple in construction, easy to operate and usable with a direct recording system employing a stylus riding on a sheet.

While a preferred form of the invention has been described in detail for the purpose of explaining the underlying principles thereof, various changes and modifications can be made without departing from the scope of the invention as defined in the appended claims.

We claim:

1. In facsimile apparatus of the character described, a rotatable drum, a clamp bar thereon having offset portions at the ends of the drum, means forming a dual pivotal support for the offset portions of the clamp bar to enable tilting of the bar about an axis along either longitudinal edge thereof, a plurality of inwardly projecting members on said clamp bar and means to actuate said projecting members to cause tilting of the clamp bar to raise its edge above the drum for insertion of the sheet to be mounted on the drum.

2. A clamp bar for a drum or similar sheet

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holder comprising inwardly projecting posts, a coiled spring on the inner end of each post, detent means including said springs and angular brackets on said drum adjacent the respective posts, said detent means being arranged to hold the clamp bar either flat on the surface of the drum or with one edge of the bar raised above the surface of the drum, and means including a U-shaped channel bar engaging at least one of the posts adapted for manual actuation to raise one edge of the clamp bar and to restore the

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clamp bar to its normal flat position to hold the edge of a sheet against the surface of the drum.

PAUL L. GRAFSTEIN.
AUSTIN G. COOLEY.

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The following references are of record in the file of this patent:

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