

- [54] **FACSIMILE TRANSCIVER**
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- [52] U.S. Cl. .... **178/7.6, 178/6.6, 178/DIG. 27, 346/68, 346/139 A**
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- [58] Field of Search ..... **346/68, 139 A, 139 B, 346/139 C; 178/7.6, DIG. 27, 6.6**

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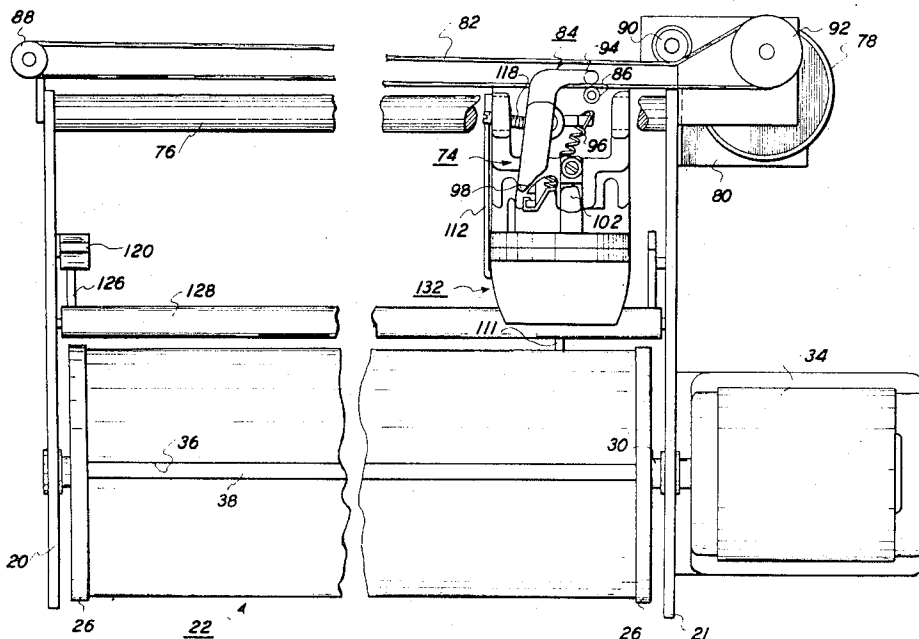
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[57] **ABSTRACT**

Facsimile transceiver of the drum scanning type wherein the writing stylus and scanning head carriage is releasably attached to a drive belt whereby the carriage can be manually moved relative to the belt to any point along the longitudinal axis of the drum. The transceiver is further characterized by the provision of stylus retracting structure which effects disengagement of the stylus from a copy sheet when the access cover is opened for removing or installing copy paper. Stylus retraction or disabling is also accomplished when the carriage is manually moved or when the transceiver is placed in the send mode of operation.

**11 Claims, 3 Drawing Figures**



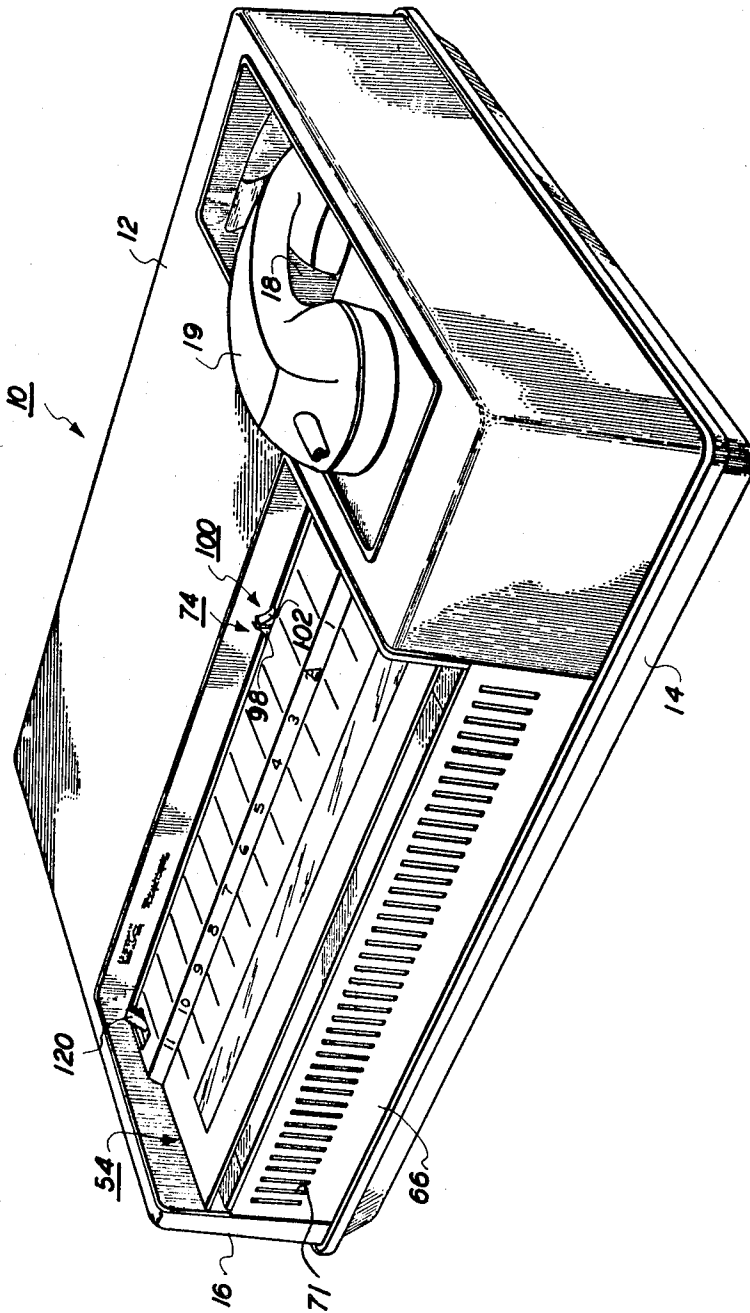


FIG. 1

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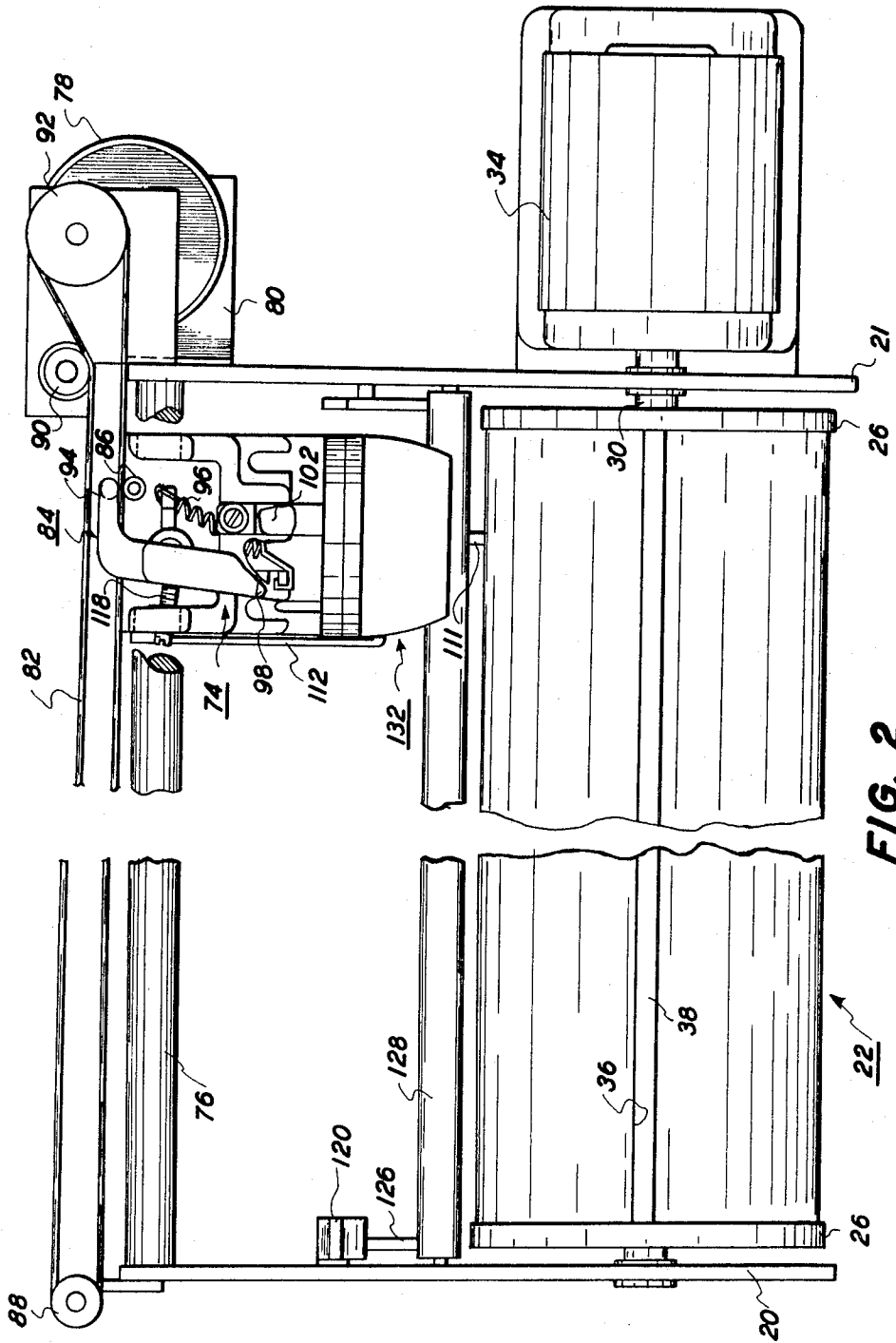


FIG. 2



## FACSIMILE TRANSCEIVER

## BACKGROUND OF THE INVENTION

This invention relates to facsimile devices such as drum scanning transceivers and, more particularly, to a pen or stylus drive and retracting mechanism therefor.

In drum scanning, facsimile transceivers, scanning is accomplished through rotational movement of the document supporting drum relative to the scan head carriage while the scan head carriage is moved longitudinally of the drum.

It will be apparent that one may not want to transmit all of the information contained in a document, accordingly, it is desirable to be able to skip blank areas or portions which are of no interest. In prior art devices this has been accomplished through elaborate control circuits and very simply by the provision of a feed screw mounted coextensively with the longitudinal axis of the drum and a half-nut secured to the carriage, the carriage being pivotally mounted relative to the feed screw so that the half-nut can be disengaged therefrom.

It will be appreciated that elaborate control circuits are costly and that the use of a feed screw requires the employment of a much more costlier drive motor than desired, in the interest of minimizing the overall cost of the machine. Furthermore, gear wear and delayed starts due to improper meshing between the half-nut and the feed screw threads, particularly when the feed screw is rotating, are inherent in the feed screw and half-nut type of arrangement.

When a transceiver is capable of manually skipping segments of a text, particularly, in the receive mode, pen or stylus retraction will be necessary prior to moving the pen along the longitudinal axis of the drum in order to prevent damaging of the pen. Pen retraction is also desirable, in order to prevent damage to the pen, when the transceiver is in the send mode and also, when the access cover is in the full open position during paper removal.

Accordingly, the general object of this invention is to provide a new and improved facsimile apparatus.

It is a more particular object of this invention to provide, in a transceiver, a new and improved drive for the pen and scan carriage.

Another object of this invention is to provide new and improved pen retraction mechanism for use in a transceiver.

Still another object of this invention is to provide interlocks for effecting pen retraction at times when the lack thereof would be injurious to the pen.

Yet another object of this invention is to provide, in a transceiver, a new and improved pen and scan carriage which can be manually moved for the purpose of skipping certain segments of the text.

Further objects and advantages of the present invention will become apparent when considered in view of the description of the preferred embodiment of the invention and drawings forming a part hereof.

## DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a transceiver incorporating the invention;

FIG. 2 is a top plan view of the transceiver illustrated in FIG. 1, but with the top cover removed; and

FIG. 3 is an elevational view, partly broken away, of the left side of the machine of FIG. 1.

## BRIEF SUMMARY OF THE INVENTION

Briefly, the above-cited objects are accomplished by the provision of a carriage drive including a motor and an endless belt, the latter of which is adapted to be coupled to the carriage by means of a clamping arrangement integral with the carriage. The clamping arrangement constitutes a pivotal lever and upstanding post member which captivate the belt therebetween, the lever being spring biased in the direction of the post member. By virtue of such an arrangement the carriage can be selectively moved during either mode of operation in order to manually skip certain portions of a document (i.e. blank areas or unnecessary information).

Since the pen or writing stylus is in contact with the copy paper during a receive mode, transverse movement of the pen relative to the paper could be injurious to the pen, accordingly, an interlock is provided which insures pen retraction or disengagement at any time the carriage is manually moved. This is accomplished by plurality of levers and cams, all of which are integral with the carriage.

Pen retraction is also effected when the access cover is fully open and when the transceiver is in the send mode. To this end, a lever arm is provided which is mounted on a frame member remote from the carriage. In the case of the mode selection, the mode selector button is also remotely supported relative to the carriage, in a position to operatively engage the aforementioned lever. An elongated cam which is coextensive with the path of travel of the carriage is so positioned as to be actuated by the remotely disposed lever arm. The rear edge of the cover acts through the same lever and cam arrangement to effect pen retraction, however, an intermediate arm is utilized.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, especially FIG. 1, reference character 10 designates generally a transceiver comprising housing structure 12 including a base member 14 and top cover member 16. The cover member 16 is provided with a recessed area 18 forming a cradle for a telephone piece 19, as shown. A coupling device (not shown) is contained in the recessed area 18 and serves to operatively connect the transceiver 10 with another transceiver by means of the telephone piece 19 and associated communications network.

Internally of the housing structure 12, supported intermediate a pair of upstanding support frames or plates 20 and 21, is a drum structure 22 comprising an outer shell 23 on which sheets of copy paper or a document (not shown) to be copied is supported during use of the apparatus in either the receive or send mode. The paper may comprise any electrosensitive composition commonly used in devices of the type herein contemplated.

The drum structure 22 preferably comprises a hollow cylinder which is formed from a material which is light in weight, yet rugged and durable in construction. Accordingly, the drum may be fabricated from lightweight metals or plastics. The drum structure further comprises a cylindrical sleeve member 24 and a pair of annular rings 26. A pair of discs 28 disposed within the rings 26 serve to close the ends of the drum structure. The discs 28, also provide means cooperating with a shaft 30 for supporting the drum structure in the bear-

ings 32, the bearings being carried by the plates 20 and 21. Counterclockwise rotation of the drum structure, as viewed from the left in FIG. 2, is attained by virtue of the synchronous motor 34 and a gear drive arrangement, not shown.

A slot 36 extending longitudinally of the drum structure 22 has disposed therein a gripper 38 in the form of an elongated bar member which is somewhat shorter than the drum structure. As viewed in FIG. 3, the bar member comprises a lip portion 40 which engages the leading edge of the paper or document to be supported on the drum structure. As can be seen, the lip portion extends toward the right as viewed in Fig. 3, or in a direction opposite to the direction of rotation of the drum structure. The bar member is supported in the slot 36 by a plurality of spring members 42 which normally bias the bar member inward such that the lip portion captivates the edge of the document between it and the surface of the shell 23.

A pair of lever arms 44 (only one being shown) are pivotally supported by the plates 20 and 21 adjacent the left and right ends (as viewed from the front of the machine) of the drum structure 22 by means of shafts 48. The lever arms are each provided with a cam surface 50 which extends from the plates 20 and 21 toward the ends of the drum structure such as to be engageable with the undersides of the end portions of the gripper member 38. Each arm 44 has an upwardly projecting flange 52 for abutment with the back edge of the gripper member to thereby provide stops for the drum structure.

A door or closure member 54 supported on pivots 56 provides access to the drum structure 22 for placement of paper thereon. The rear edge of the door structure acts as a camming surface to effect pivoting of the lever arms 44 and when the door is raised to its open position. To this end, the arms 44 are provided with a rearwardly extending segment 62 which engaged by the rear edge 60. It will be appreciated that by virtue of the construction of the lever arms 44 and, the drum structure will be stopped and the gripper raised for insertion of a paper, when the gripper bar is at approximately top dead center thereby facilitating installation and removal of paper. Furthermore, although not apparent from the drawings, the relationship of the lever arms 44 with the door structure 54 is such as to permit the door structure to be opened a substantial distance before interaction of the rear edge 60 and the rearwardly extending segments 62 takes place. Thus, the door structure which is mounted for rotation through an angle of approximately 90°, can be rotated about 70° without effecting actuation of the gripper bar 38.

Inasmuch as the instant construction provides for a free trailing edge of the document or copy paper supported on the drum structure 22, a plurality of guide members are located about the drum periphery to maintain the paper or document in close proximity to the surface of the drum structure during operation. To this end, a plurality of ribs 64 are secured to a front door structure 66 pivotally supported by the frames 20 and 21. A plurality of ribs 68 are also provided as an integral part of the door structure 54 such that when the door structure is in its closed position a guide way is effected between the ribs 68 and a portion of the drum structure 22. Adjacent, the drum structure, at the side thereof opposite the door structure 66, a plurality of wiper bars 70 mounted by a means of a rod 72 serve

the same purpose as ribs 64 and 68. The door structure 66 is provided with a plurality of louvers 71 for permitting heat to escape from within.

Disposed rearwardly of the drum structure 22 supported for transverse movement contiguous thereof is a carriage 74. The carriage is mounted for travel intermediate the support frames 20 and 21 by a pair of guide and support rods 76, only one being shown, the ends of which are supported by the frames 20 and 21. A motor 78 carried by a support bracket 80 together with an endless belt 82 serve to move the carriage between its end-of-travel positions.

A lever arm 84 mounted on the carriage 74 for pivotal movement about the vertical axis cooperates with a post member 86 to attach the carriage to the belt 82 for movement thereby, the belt being operably supported by a plurality of pulleys 88 and 90 and 92, the latter of which is carried by the output shaft of the motor 78. An offset segment 94 of the arm 84 is urged in the direction of the post member by means of a bias spring 96 secured, both to the movable arm and to the carriage. The circumference of the post member is knurled or otherwise suitably treated so as to prevent relative slippage of the belt 82 between the segment 94 and the post member. An offset segment 98 of the arm 84 extends upwardly past the top wall of the cover (see FIG. 1) for facilitating manipulation thereof by the operator. A stationary arm 100 also secured to the carriage 74 has an offset segment 102 which extends upwardly past the cover and is disposed adjacent to but spaced apart from the offset segment 98. Thus, the carriage can be moved to any point along the axis of the drum structure 22 through the movement of the offset segment 98 toward the segment 102 which releases the carriage from the drive belt.

As viewed in FIG. 3, a recording pen 111 or stylus structure 104 is pivotally supported by a pivot member or pin 106 forming an integral part of the carriage 74. The pen structure comprises a pen holder 108 and a pen 111 the holder being normally biased in the counterclockwise direction such that the pen is urged into engagement with the copy paper. It should be apparent that while certain relative motion between the pen and the drum are acceptable, at least one is not. In other words, it would not be desirable to have manual movement of the pen 111 along the longitudinal axis of the drum structure 22, while the pen engages the paper. Accordingly, when the carriage is manually moved through manipulation of the offset segment 98, it is necessary that the pen 111 be disengaged from the copy sheet. To this end, an L-shaped cam arm 112 is pivotally supported by the carriage 74 for movement about a horizontal axis. The lower end of segment 114 engages the top of the pen holder 108 such that clockwise movement thereof will effect clockwise movement of the pen holder to thereby effect disengagement of the pen 111 from the copy paper. The upper end of segment 116 of the L-shaped arm 112 engages a horizontally movable rod 118 (see FIG. 2) which pivots with the lever arm 84.

Thus, it can be appreciated that whenever the carriage is manually moved through manipulation of the offset segment 98, the pen 111 is moved out of engagement with the copy paper.

It will be appreciated that disengagement of pen 111 at other times will also be necessary. For example, when the transceiver 10 is in the send or transmit mode

of operation. For this purpose, there is provided a mode selector 120 which is pivotally supported by the frame member 20 in a position such that the upper end 122 thereof is accessible adjacent the top of the cover structure 12 and the lower end 124 thereof engages a bar link 126 also pivotally supported by the frame member 20. The bar link, at its lower end engages an elongated cam structure 128 which in turn engages a cam follower 130 forming an integral part of pen holder 108. It will be appreciated that since the pen holder 108 moves with the carriage 74, the cam follower 130 is coextensive with the longitudinal axis of the drum structure 22 so that the mode selector can be changed from the receive to the send mode anywhere along the traversed path of the carriage and the pen 111 will be retracted by virtue of the clockwise rotation of the cam follower 130 which is effected through movement of the bar link 126 in the counterclockwise direction by the mode selector 120.

At one other time it is desirable to have the pen 111 out of engagement with the copy paper, that is, when the door structure 54 is in its fully open position. Accordingly, the rearwardly extending segment 62 of the pivotal arm 44 engages the bar link 126 to effect counterclockwise movement thereof which as discussed hereinabove causes retraction of the pen 111.

An optical scanning device 132 supported by the carriage 74 for movement therewith is employed, in the send mode of operation, to transmit information contained in a document. The device 132 is positioned above the location of the pen 111 (approximately 60° along the circumference of the drum) to thereby prevent contamination of the optics by paper residue. Since the specific details of the device 132 form no part of the present invention a detailed discussion thereof has been omitted. However, it will be noted that a suitable scanner is disclosed in U.S. Patent application Ser. No. 795,510, now U.S. Pat. No. 3,561,846 filed in the name of David O. Kingsland and assigned to the same assignee as the present invention. The optical scanning device is adapted to be energized through the closing of a switch (not shown) which is mounted on the frame 20 in a position to be operated by a switch actuator 134 operatively coupled to the mode selector 120.

What is claimed is:

1. Transceiver apparatus comprising:

a rotatable document supporting drum structure, a stylus and support carriage therefor mounted for movement along the longitudinal axis of said drum structure,

drive means including an endless belt, and

means for attaching said carriage to said endless belt for movement therewith and providing manual means for moving said carriage relative to said endless belt, said attaching means comprising a manually actuatable lever one end of which is spring biased towards a post member whereby the belt is securely captivated between said one end and said post member.

2. Structure as specified in claim 1 including, means associated with said manually actuatable lever for effecting movement of said stylus away from said drum upon actuation of said lever.

3. Structure as specified in claim 1 wherein, said scanning device is mounted above said stylus and spaced apart from a 60° therefrom.

4. Structure as specified in claim 1 including, means cooperating with said mode selecting means for moving said stylus away from said drum structure once the apparatus is conditioned for transmitting.

5. Structure as specified in claim 4 wherein said means for moving said stylus away from said drum structure comprises lever means supported by a stationary support frame and an elongated cam member which is co-extensive with the longitudinal axis of said drum structure.

6. A facsimile transceiver comprising, housing structure, a document supporting drum structure, means for imparting rotational movement to said drum structure, a carriage having a recording pen and scanning means thereon, means for moving said carriage relative to said drum along the longitudinal axis thereof, a cover structure providing access to said drum structure for installing a copy sheet thereon and, means for effecting movement of said recording pen away from said drum structure when said cover structure is moved to an open position, said movement effecting means being ineffective when said cover structure is moved through an angle less than 70°.

7. Structure as specified in claim 6 including, mode select means for conditioning said machine for either transmitting or sending, and;

means operatively associated with said mode select means for effecting movement of said recording pen away from said drum structure when said machine is in the transmit mode of operation.

8. Structure as specified in claim 6 including, a drive arrangement drivingly connected to said carriage, said drive arrangement including an endless belt, and

manually operative means for disconnecting said carriage from said endless belt for permitting relative movement therebetween over a portion of said belt coextensive with substantially the longitudinal axis of said drum structure.

9. Structure as specified in claim 8 including, means actuated by said disconnecting means for rendering said recording pen inoperable.

10. Structure as specified in claim 9 wherein, said means actuated by said disconnecting means comprises a cam and lever arrangement effective to move said pen recording structure away from said drum structure.

11. Structure as specified in claim 10 including, mode select means for conditioning said machine for either transmitting or sending information, and means actuated by said mode select means for rendering said recording pen inoperable when said machine is conditioned for the transmit mode of operation.

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