

[54] **MECHANICAL STENOGRAPHIC APPARATUS FOR TRANSCRIBING GROUP PROCEEDINGS**

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Related U.S. Application Data

[63] Continuation-in-part Ser. No. 1,739, Jan. 9, 1970, Pat. No. 3,646,576, which is a continuation of Ser. No. 252,569, May 12, 1972, abandoned.

[52] U.S. Cl. **170/1 SE, 179/1 CN, 179/100.1 DR**

[51] Int. Cl. **H04m 1/00**

[58] Field of Search 179/1 SA, 1 VS, 100.1 DR, 179/1 CN; 178/31; 35/35 R

References Cited

UNITED STATES PATENTS

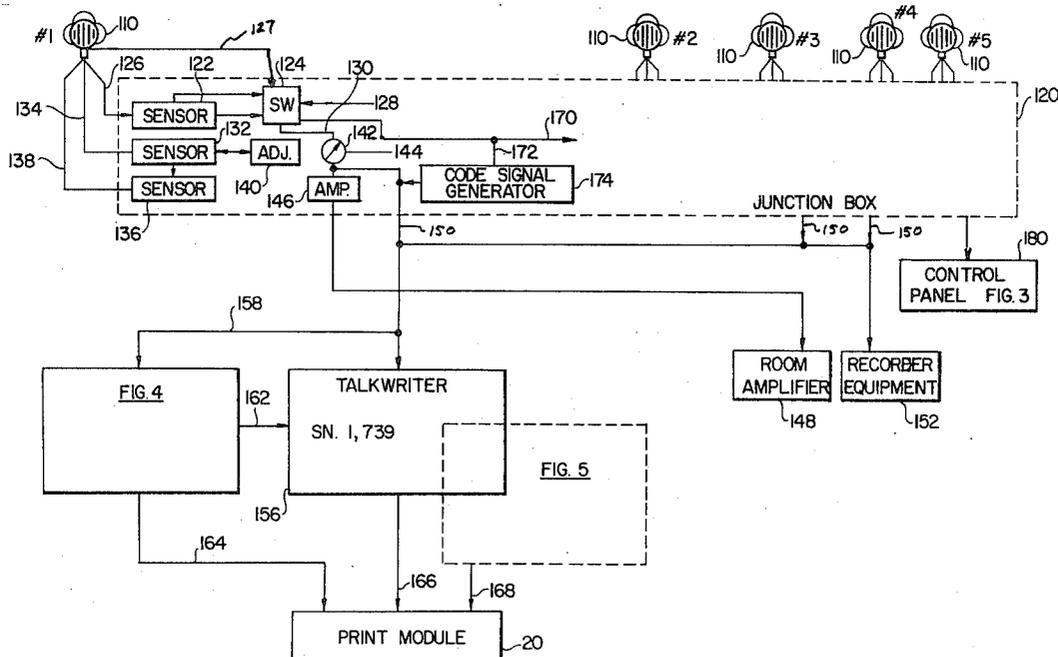
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 Attorney, Agent, or Firm—Misegades, Douglas & Levy

[57] **ABSTRACT**

A system for receiving signals from a plurality of positions in a conference or group proceeding, and for amplifying, processing and recording the vocal data prepared for subsequent machine-transcription by a talkwriter, as embodied in my United States patent application Ser. No. 1,739, filed Jan. 9, 1970, allowed Sept. 17, 1971, now U.S. Pat. No. 3,646,576. A central tape-recording installation is provided with multiple-microphonic inputs, each having individual indication as to when its channel is open, and each having analyzer circuits to advise and indicate at the receiver input positions whether the signal comprises words spoken too fast, or too softly, or other such characteristics; the system is also provided with means to transmit and record only while sound is received, thereby eliminating dead-times from being recorded. A central console is provided and through it, over-ride of some of these features and selective replay are also available. Print-out by talkwriter equipment is augmented with means included in this invention to identify reception of different input stations on its transcriptions of the spoken material. Also like means provide indication on the print-out of any section that is a phonetic read-out rather than clear readable typography representing actually identified words.

11 Claims, 5 Drawing Figures



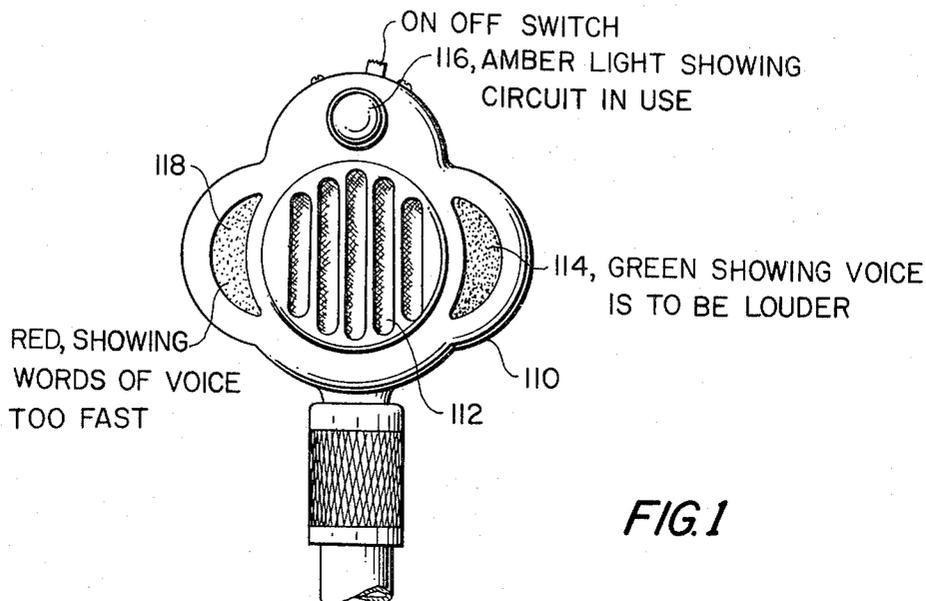


FIG. 1

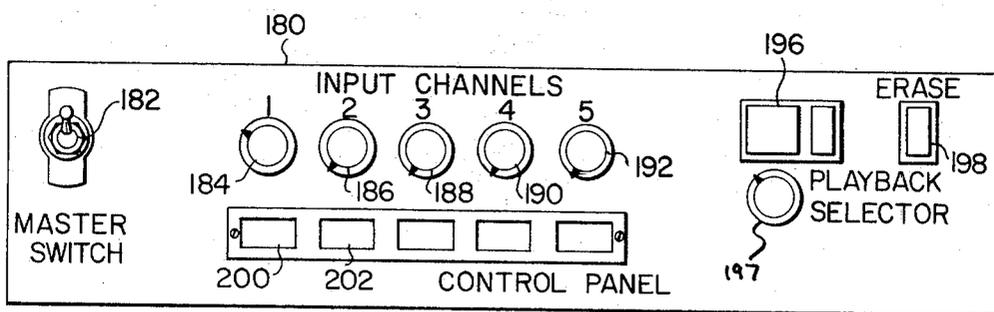


FIG. 3

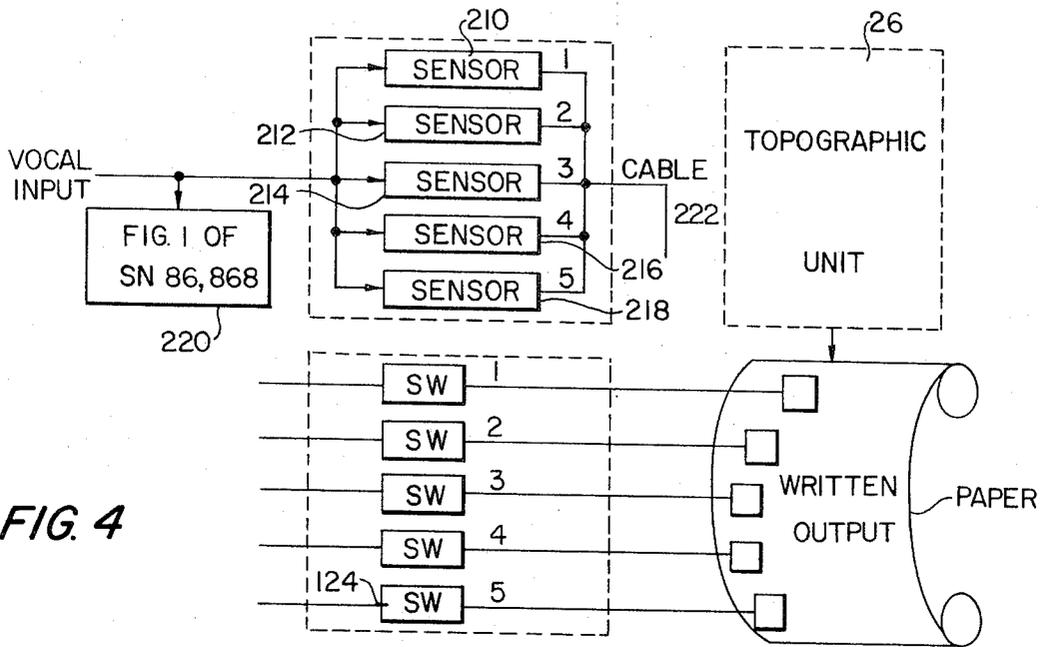


FIG. 4

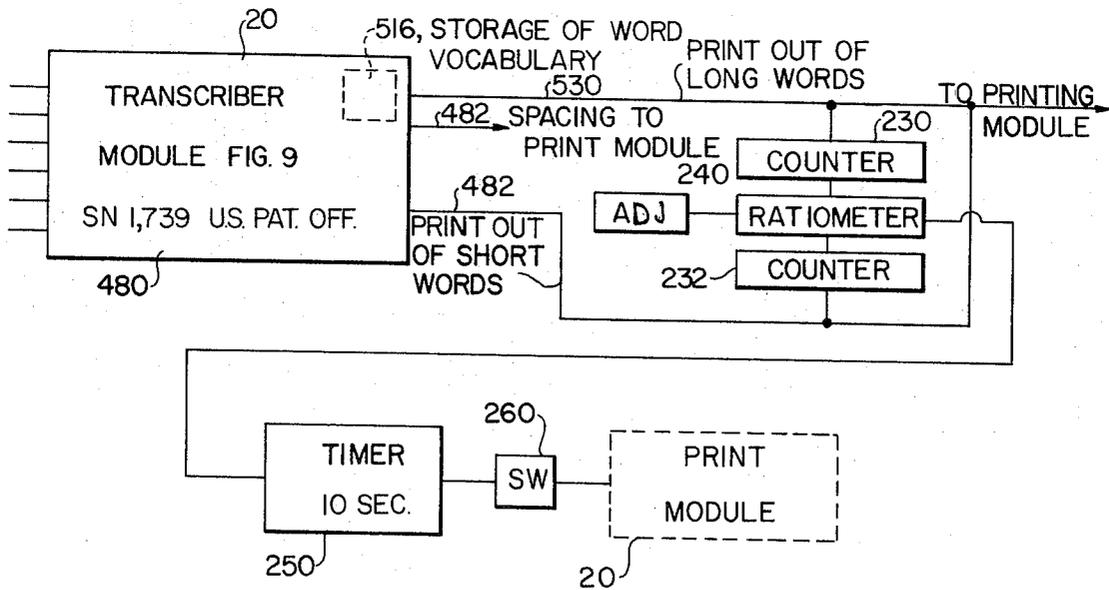


FIG. 5

MECHANICAL STENOGRAPHIC APPARATUS FOR TRANSCRIBING GROUP PROCEEDINGS

CROSS-REFERENCES TO RELATED APPLICATIONS

This application is a continuation application pursuant to 37 C.F.R. 1.60 of my Application Ser. No. 252,569, filed May 12, 1972, now abandoned without prejudice.

The present invention is a continuation-in-part of the inventor's application Ser. No. 1,739, filed Jan. 9, 1970, now U.S. Pat. No. 3,646,576. The specification thereof is incorporated herein by reference with the Notice in the Official Gazette of Jan. 27, 1970.

One aspect of the invention provides conjunctive use with the Sound Separator of my application Ser. No. 86,868 (now allowed), filed Nov. 2, 1970, for "Sound Separator for Talkwriter Apparatus," in which FIG. 1 thereof is modified from the figure of the parent type application Ser. No. 1,739, supra. The specification, therefore, of Ser. No. 86,868 is incorporated herein by reference, also in accordance with the Notice in the Official Gazette of Jan. 27, 1970. Other changes may occur, but are considered incidental in view of the overall disclosure. It is understood and disclosed that the present invention may be functional in system independent of the aforesaid feature of transcription by talkwriter.

Patents found of background relevancy are:

Mitchell	2,336,880	Huber	3,530,247
Coel	3,423,532	Edson	3,601,530

BRIEF SUMMARY OF THE INVENTION

The present invention relates to typographic transcribing apparatus for a plurality of sound inputs of group or conference proceedings, and more particularly the present invention is directed to particular features of certain means for amplifying, recording, and preparing or processing group-derived voice data into a composite machine transcription with indicia means of identifying means cognizant of the source of the date. In particular the machine transcription feature, when desired, is supplied as a component to the talkwriter system of a kind set out in the foregoing referenced patent applications, with additions in part as set out in the present invention by adapting the function of the talkwriter to the environment and use of the present invention.

The apparatus of the present invention provides a system of centrally recording variously positioned voice inputs capable of four or more hours of continuous and automatic operation. It may be set to exclude the recording of periods of silence. The apparatus functions to accept multiple microphone inputs alternately and successively, upon actuation of each respective input channel by its voice actuating it, and the system provides a coded, separate, sub-audible identification code or signal for each of the several given input channels. The arrangement of the components of the invention provides for amplification from a common loudspeaker for the courtroom or conference room, or the like, of each of the several and various inputs as they are being spoken, recorded and processed for actuating the talkwriter, which provides the typographic record of the several input channels.

A further object and advantage of the invention is to provide at each input station or position a visual indication means on or about the microphones at the several positions — 1. means to show when another microphone is being used or is using the circuit to send voice to the processing means of the talkwriter; 2. means to show when speech signals in the given input channel are too weak or soft for significant processing and recording; and 3. means to show when speech input in the given input channel is too rapid or fast for processing and for subsequent automatic machine print-out by the talkwriter.

Another object of the apparatus of the invention is to provide central control means which permit instantaneous recall or replay of recorded sections of the tape, for example, of up to 20 or so minutes previously recorded, with options of selective erasures and the option of subsequent return to time-zero with both processes essentially instantaneous. In addition to activating or closing down the entire apparatus, the central console has separate volume and ON-OFF controls for each input channel. There is also provision for command engagement of the tape with any selected input channel, even in the absence of current verbal input signals passing through it.

Thus the objects and advantages of the apparatus of the invention provide for an amplified hearing or acoustic output of what is being recorded. It also affords re-reading or editing through selective repetition and/or deletion. The voice-recorded material or signals are reasonably audible for machine transcription by the talkwriter because of the microphone arrangements, signal lights, and indicator means. Transcription by the talkwriter will take only as long as the actual spoken material itself took, minus silences.

Another advantage of the invention resides in cases where speech should prove too rapid or where accents or impediments might impair a direct read-out in transcription by a talkwriter apparatus. In such cases, a phonetic specialist's services may be needed in order to obtain a legible transcription. By means of a modification in the talkwriter's print-out, the presence of such material can be shown visually, section-by-section and page-by-page. Identification of the separate input channels through coded sub-audible signals on the tape can be converted by the talkwriter into colored identifying markings showing the speaker on the typescript, or, more simply, a digit code and a new line of printing can mark each change of speaker on the talkwriter output.

Except for the modifications to the talkwriter, most other elements of the apparatus are already within the state of the art, but heretofore have not been correlated in the present manner to perform a function of this sort. Some special adaptations are required, however, and the central control console and the microphone signals must be created for this use.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

The above and other objects and advantages of the invention will become apparent upon full consideration of the following detailed description and accompanying drawings in which:

FIG. 1 is a typical front view of a portion of a microphone of the system showing indicator elements according to a preferred embodiment of the invention;

FIG. 2 is a schematic diagram of the system of the invention showing the several component elements comprising the system according to the preferred embodiment;

FIG. 3 is a diagrammatic view showing the control panel used in the system of the invention;

FIG. 4 is a schematic diagram of a manner of coding the printed output for illustrating the individual or separate sources for the total printed output; and

FIG. 5 is a schematic diagram of means for controlling the print-out in providing a readable transcription.

DETAILED DESCRIPTION

Referring now to the drawings, there is shown a voice-signal-receiving microphone 110, having a conventional acoustic energy receiving area 112, a light means 114 for indicating on illumination that the received voice energy is generally soft or weak in amplitude or is below a given reference level as measured in decibels; a light means 116 for indicating on illumination that a microphone 110 in another position (described below) is receiving voice or acoustic energy; and a light means 118 for indicating on illumination that the received voice energy generally contains words or phrases or other components spoken too rapidly, or at least detected to contain a word rate above a given detectable norm rate. Each desired position shown in FIG. 2 has the microphone 110.

FIG. 2 further shows apparatus or junction box means 120 containing voice signal sensor 122 to detect signals present in the microphone 110 and producing an output fed to a switch 124 which also receives a fed input of signals from the microphone over conductors 126. The switch 124 receives fed inputs 128 from corresponding switches to 124 at other microphone locations and by logic circuit means of the switch 124, an output terminal line 130 feeds the signals of microphone 110 when no signals are present at other microphone positions. The switch 124 through connector 127 also connects or disconnects illumination of a light bulb in amber light 116 (See FIG. 1) of the microphone 110 showing whether the recording circuit is in use by another microphone of the system; a sensor 132 is fed by the voice signal passing through the sensor 122 and the signal is processed in sensor 132 to develop an output when it evaluates that the strength of the signal is too soft or too weak. The sensor 132 provides a signal over conductor 134 to the green light 114 (See FIG. 1) showing the voice energy should be louder. A sensor 136 also receives the voice input signal 126 passing through 132 for processing the speech to produce an output in conductor 138 showing that the voice word-rate is too high, i.e. that the speech is too fast so that the output on conductor 138 to the red light 118 (See FIG. 1) for illumination that indicates the received voice energy generally contains words or phrases spoken too rapidly. A manual adjustment means 140 is provided for sensor 132.

The output line 130 of switch 124 may be provided with a volume control means 142 controlled by a control console over means 144. An amplifier 146 connected to the volume control means provides a voice output to a room amplifier or public address system 148 of conventional construction. Also the signal from the volume control means 142 is coupled over conductor 150 to tape heads (not shown) of voice recorder equipment 152 for storage of signals and/or to conduc-

tor 12 of a talkwriter apparatus 156 as shown in Ser. No. 1,739 now U.S. Pat. No. 3,646,576, and which may include the modification shown in FIG. 5 below; to conductor 158 of a coding system 160 shown in FIG. 4 below, which in turn provides an output 162 to the talkwriter and an output 164 to the print module 20. Print module 20 is also responsive to output signals 166 and 168 from the talkwriter 156 and FIG. 5, respectively.

Similarly, other switches similar to switch 124 connected at other microphone positions receive an "in use" signal from the switch 124 over conductor 170, which also provides a signal on conductor 172 to a code signal generator 174 that produces a distinctive coding signal of, for example, sub-sonic frequency that identifies the related microphone position that is active for thus identifying the active channel on the printer output by sending such coded sub-sonic, or other, signal over conductors 12 and 158 to the coding system, FIG. 4, thence to the print module 20 where each given code signal identifies each input channel.

The sensor 136 may contain any form of logic circuit analyzing speech to detect if the speech rate is too fast; the preferred embodiment is a rate sensor 136 that counts the rate of changes from voiced segments of input to un-voiced segments of speech input and vice-versa in a given frequency range, such as the audio band of 400-600 Hz. When a significant count of changes at the rate of, for example, over 4 or 5 per second takes place, the sensor 136 activates the "too fast" light 118 for the related input microphone 110. The other sensor 132 may be, as suggested above, a signal-amplitude sensor with a time-lag feature having an adjustable threshold level controlled by an automatic volume control (afc) circuit (not shown) or the adjustment means 146 described above. Thus if the input signal to the sensor 132 is weaker than the threshold setting, the "louder" light is activated or is caused to blink to achieve the desired indication to the speaker.

In FIG. 3, there is shown a central control console 180 which is provided with an ON-OFF toggle switch 182 for the entire system apparatus. There are separate control knobs 184-192 for each of the several input channels for separately controlling or governing the line condition of ON-OFF, volume, tone and other respective characteristics of the several channels for recording. A play-back selector with backward time indicator 196 governs instantaneous recall or replay of recorded material at various selected tape points within a preceding 20-minute interval or portions thereof of recorded material, and control of time forward or back is provided by selector means 197. Erasure is controlled by pressing spring-loaded button 198. An interlock feature (well known, but also not shown) provides that during operation of the play-back selector 196, all input channels are locked off.

Push-button control knobs containing operational lights 200-202 provide manual override of automatic input channel monopoly by engaging each channel independently. The lights indicate when a particular input channel has been left engaged in a dominant continuous record status, and this provision serves as a warning in cases where any channel is inadvertently left monopolizing the system and using up tape for dead time or blocking off other desired transmissions.

The talkwriter apparatus 156 is modified by external inputs applied to it over the single voice input as shown

in Ser. No. 1,739, now U.S. Pat. No. 3,646,576, for thus transcribing copy from a tape (not shown) in recorder equipment 152 controlled by the control panel 180. The sub-sonic code frequency or signal distinguishes the identity of each input channel and the code signal is detected as a continuous input at times when a given microphone position 110 is activated. Each position therefore is identified by a different sub-sonic frequency produced by generator 174 and this sub-sonic code is recorded also by the voice recorder equipment 152. The identification of the sub-sonic code is shown in FIG. 4 in which the sub-sonic signal and the voice signal pass along the conductor or cable 12 to a bank of a plurality of frequency selectively-tuned sensor, 210, 212, 214, 216, 218 that scan the sub-sonic signals and the respective ones of sensors 210-218 will correspond to the microphone positions 110.

The vocal signal on conductor 12 passes to the circuit 220 which is FIG. 1 of Ser. No. 86,868.

One of the sensors 210-218 may pass the code or decode and then activate a gated output within the sensor to send a signal over cable 222 to activate a selected code word in the typographic unit 26, whether it is a position number corresponding to the microphone positions 110 . . . , or other identifying indicia, whether color, form of type or the like; the print-out may be color-coded, color ink selection means activated by one of the selected sensors 210-218, or a print-out digit for appropriate identification of the microphone position, which also could be used to activate a code name or word for the microphone positions 110 . . . , and which as well may be used to shift the print-out to a next following line of the print-out paper or medium.

It is within the contemplation of the invention that coded lines from each decoding sensor 210-218 may be connected by lines to respective switches 124 through the sensor output of cable 222 for individual indicia independent of the typographic unit.

Another modification of the invention is shown in FIG. 4 wherein a similar identification on the print-out is either color-coded or provides a margin indentation or identification, so that material being printed out will be color-coded where, for example, a colloquy of two voices is to show on the print-out. An example of this would be a two-color ink ribbon that is shifted by a given voice signal and reshifted back on the absence or change of voice signal. Another means contemplated is by the application of color dyes or inks to the paper, as is well known and exemplified by patents such as found in Class 340.

Material is then printed out during successive 10-second intervals when the ratio of the number of stored longer words being printed to monosyllabic short words and isolated speech elements being printed is less than about one to five, for example. The mechanism needed to do this, as shown in FIG. 5, involves two counters 230,232 operating jointly, one on the released outputs from the small word bank from conductor 484, and the other on release of stored words from the long-word storage bank from conductor 530. The counters 230,232 are installed on the two respective feeder lines 484,530 (see Ser. No. 1,739, now U.S. Pat. No. 3,646,576) prior to their merging to drive the printer 20; the ratio of their periods of respective activity is set adjustably and the duration of those periods is compared by ratiometer 240 so that within successive 10-

second periods as measured by timer 250, a switch 260 is activated to signal that the output material which will have just been printed may require human processing to give a readable transcription. This indication will occur when the desired ratio is obtained.

Additional embodiments of the invention in this specification will occur to others and therefore it is intended that the scope of the invention be limited only by the appended claims and not by the embodiments described hereinabove. Accordingly, reference should be made to the following claims in determining the scope of the invention.

What is claimed is:

1. A data processing method for identifying separate input sources of voice signals and converting them to correspondingly identified sequences of input signals for alpha-numeric print-out means comprising the steps of:

1. receiving voice signals from a plurality of signal input positions,
2. indicating at the respective input stations the intervals when unsuitable weakness of input signals occurs,
3. passing the voice signals both through an amplifier for aural monitoring and editing and passing them also to a talkwriter system for processing the voice signals into alpha-numeric signals cognizant by a print module, and
4. identifying alpha-numeric outputs of the print module by the respective one of a plurality of signal input positions whence it was received.

2. The invention according to claim 1 wherein the step includes processing the voice signals to indicate the voice signal received at each respective position may comprise "too fast speed," and producing a voice signal component containing words spoken more rapidly than a given normal, pre-set rate.

3. The invention according to claim 1, wherein the step includes processing the voice signals to indicate that other voice-receiving positions are in use.

4. The invention according to claim 1 wherein the step includes processing the voice signals to indicate that the voice signal received at that respective position may comprise a voice signal component containing words spoken too softly.

5. Mechanical stenographic apparatus for transcribing group proceedings comprising:

a plurality of microphone positions arranged for group proceedings;

sensor and switch means to allow pre-emption of voice reception at any one of the given input positions by switching OFF the reception of voice at any of the other positions;

means indicating separately to each voice station the fact of this pre-emption;

means providing a sub-sonic or other coded signal indicative of each of the respective microphone positions by which they are identified on the print-out; processing means preparatory to translating said voice reception into alpha-numeric characters for print-out onto a reading medium; and

identification means sensitive to the microphone positions for imposing an identification indicia upon said reading medium indicative of the source position of the transcribed voice reception.

6. The invention according to claim 5, wherein means producing a sub-sonic code signal indicative of

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the microphone positions actuate said identification means.

7. The invention according to claim 5 wherein a room amplifier is coupled onto the sensor means to provide amplification of the voice reception throughout the area of the group proceedings.

8. The invention according to claim 5 wherein amplitude sensor means responsive to the voice reception provides an indication to the microphone position when the voice reception amplitude is low.

9. The invention according to claim 5 wherein "too fast speech" sensor means responsive to the voice reception provides an indication to the microphone position when the voice reception is sensed as being at a rate more rapid than a given normal rate.

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10. The invention according to claim 5 wherein a set of counters in a talkwriter measures the word length by measuring the rate of occurrence of unrelated short sounds versus that of whole words transcribed for comparison in a ratiometer to actuate means for indication of ineffectually transcribed signal material in a print module, such material occurring as a result of 'too fast speech' dialectal variations, or unclear enunciations.

11. The invention according to claim 5 wherein a central control panel provides monitoring some override features, and centralized control of the process permitting editing of material while the proceedings are in process.

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