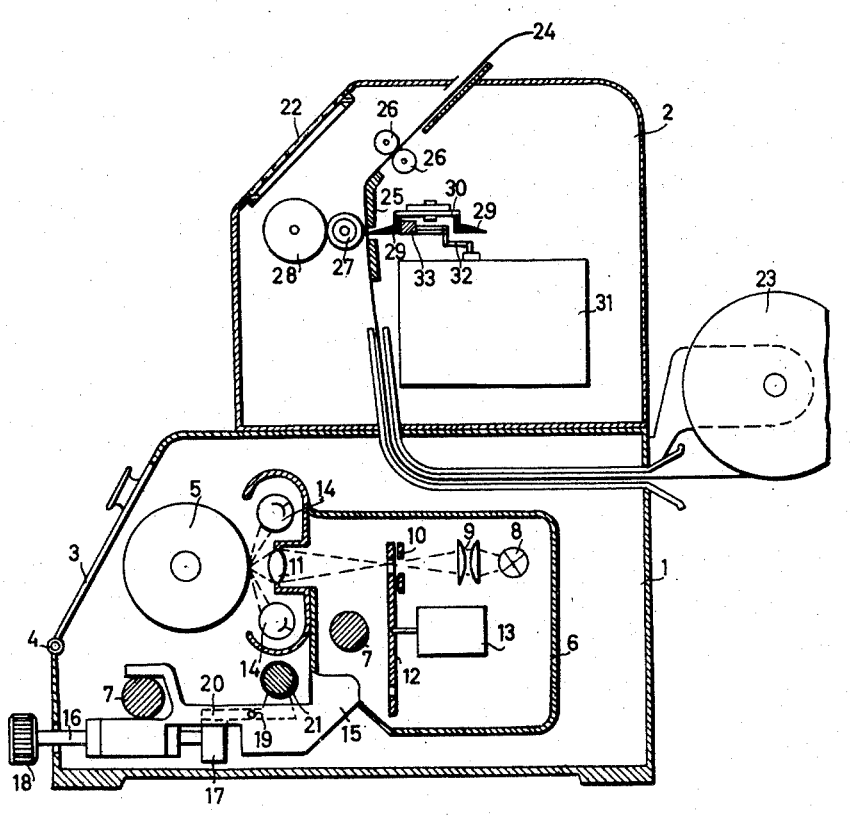
July 15, 1958 R. HELL ET AL 2,843,663

DEVICE FOR TRANSMITTING STATION IDENTIFICATION IN FACSIMILE TELEGRAPHY

Filed Aug. 16, 1954 2 Sheets-Sheet 1

Fig.1



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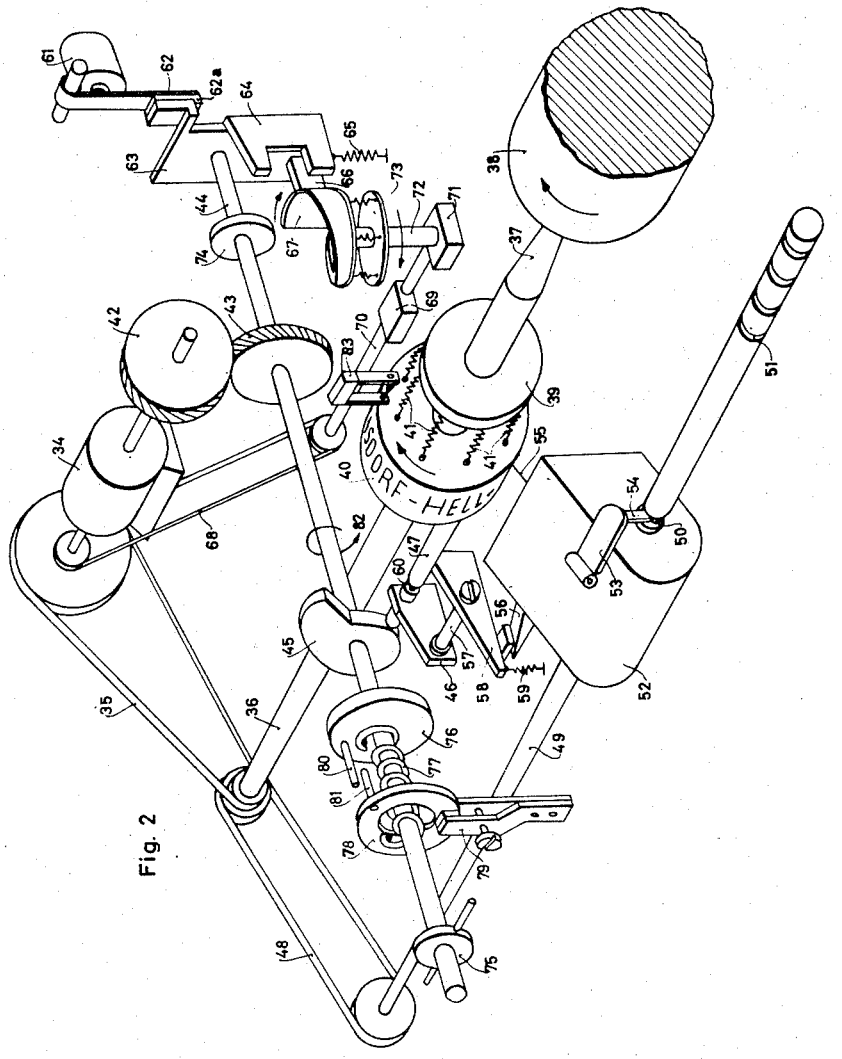

Fig. 2

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DEVICE FOR TRANSMITTING STATION IDENTIFICATION IN FACSIMILE TELEGRAPHY

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19 Claims. (Cl. 178—7.1)

This invention relates to facsimile telegraphy and is particularly concerned with a device for transmitting the station identification.

The individual stations in teleprinter systems are equipped with devices for transmitting the station identification, such devices becoming operative responsive to the station identification signal to transmit the name of the corresponding station. Such station identification means are made as impulse transmitters for the five-code alphabet to conform to the peculiarities of the teleprinter technique; they cannot be employed in facsimile telegraphy because the recording of the transmitted symbols takes place in a manner which is entirely different from the recording of the symbols in teleprinter systems.

It was, therefore, until now the practice to transmit the station designation in facsimile telegraphy by telephone prior to the facsimile transmission. With progressive development of facsimile telegraphy to fully automatic operation appears the desirability or necessity for using automatically operating station identification. The corresponding station identification must however be adapted to the pointlike recording of the facsimile receiver and must be constructed as simply as possible.

In accordance with the invention, a fixed lettering, independent of the variable symbols to be transmitted, designating the station name is for this purpose provided upon an annular or arcuate member which rotates with the symbol transmitter drum and which is scanned by the scanning element of the transmitter. The name of the transmitting station is, therefore, in principle photoelectrically scanned, in konwn manner, just like the facsimile that is being transmitted but separate from such facsimile, and is similarly recorded in the receiver. The scanning takes place responsive to the request for the station identification. It is immaterial for the invention whether facsimile telegraphy or half-tone symbol transmission is concerned or whether the recording at the receiver is accomplished photographically, electrochemically or mechanicaly by means of inked stylus or knife-edge means. The annular lettering signifying the station name or designation is disposed upon the symbol transmission drum or upon a separate station identification drum which is suitably coupled with the symbol drum. The lettering is exchangeable, permitting provision of a corresponding name for each station.

A particularly simple arrangement is in accordance with the invention obtained by moving the scanning device of the transmitter during the symbol transmission in known manner along the rotating symbol drum while causing it to stand still during the scanning of the rotating station name identification drum. The station name drum is for this purpose mounted for rotation and also for axial shifting by a constantly rotating drive cam. The drive cam is for continuous scanning of the station name so arranged that the name drum is axially slowly shifted and abruptly brought into its initial position at the end of the scanning. In order to begin the scanning at the upper

edge of the lettering of the identification name, responsive to the station identification signal, the invention provides a start device which briefly interrupts the continuous drive of the cam disk so that such disk can always rotate into the initial position by the force of a torsion spring. The station name may serve as an interval signal by continuous scanning and transmission or it may be transmitted once as an acknowledgment. A terminal contact is in the latter case actuated which is arranged at the end of the advance of the station name drum for interrupting the electrical scanning signals.

The various objects and features of the invention will now be explained with reference to the accompanying diagrammatic drawings in which

Fig. 1 shows a combined facsimile transmitter and receiver apparatus comprising an associated station identifying device; and

Fig. 2 illustrates details of an embodiment of the station identification device made in accordance with the invention.

Fig. 1 shows a transmitter **1** on which is provided a receiver **2**. Both apparatus are driven in common by the motor of the receiver **2**. The casing of the transmitter **1** is provided with a door **3** which is pivoted at **4** for gaining access to the picture or symbol image drum **5**. A scanning slide **6** is provided for sliding motion relative to the drum **5** which is guided along two rails **7**. The slide contains an illuminating source **8** which illuminates the picture point or dot shutter **10** over the condenser **9**. The objective **11** reproduces the symbol dots on the drum **5**. A perforated disk **12** rotated by the motor **13** is disposed in the light beam path. The light reflected from the image carried on the drum **5** falls into the two photoelectric cells **14** and is, in known manner, converted into an electric current which is in known manner amplified and conducted to the transmission line. From the scanning slide **6** extends a bracket **15** in which is journalled the shaft **16** carrying at one end thereof an eccentric disk **17** which is rotatable by 180° by means of the knob **18**. The eccentric **17** engages a lever arm **20** which is pivoted at **19**, the other end of said lever arm forming a grip for engagement with the threaded slide or advance spindle **21**. Rotation of the eccentric **17** releases the grip of the lever arm **20** from engagement with the thread or spiral groove of the spindle **21** and the entire scanning slide **6** may then be moved manually by means of the knob **18** so as to adjust the slide relative to the image drum **5**. The station name transmitting device is disposed upon the shaft of the image drum **5**, in back of such device as seen in Fig. 1, and therefore invisible in such figure. The image drum **5** and the slide advance spindle **21** are connected by suitable gear wheels.

The receiver **2** disposed upon the casing **1** of the transmitter is provided with a window **22** for observing the recording. Numeral **23** indicates a supply reel for the wide paper sheet **24** which is guided on suitable sheet guides and lies taut along the table **25**. The width of the paper sheet **24** corresponds to the circumference of the image drum **5**. The advance of the paper is controlled by the draw rollers **26**. The printing spiral **27** which is continuously inked by the ink roller **28** rotates in front of the table **25**. An endless chain **30** carries scanning members **29** spaced thereon by intervals corresponding to the width of the paper sheet and one of these scanning members **29** is therefore always disposed within the cutout in the table **25**. The magnet system **31** operates a printer bar **33** over a link **32** in step with the image impulses to press the respective scanning member which happens to move within the slot in the table **25** against the paper **24** and the latter against the printer spiral **27** so as to effect in known manner the recording of the image elements. The

magnet system **31** is connected with the transmission line and may be connected with its associated transmitter **1** so as to effect recording for control purposes. The shafts for the elements **26**, **27**, **28** and **30** are coupled for common control.

Referring now to Fig. 2, the motor **34**, which is conveniently illustrated as a part of the drive of the receiver **2** on the transmitter **1** shown in Fig. 1, drives the main shaft **36** over the belt **35**. The shaft **36** is connected with the removable image drum **38** over the frusto conical member **37**. Fixed upon the shaft **36** is the disk **39** and the axially movable annular or arcuate member **40** forming the station name drum which is splined to the shaft and pressed away from the disk **39** by the springs **41**. The motor **34** also drives the gears **42/43** for rotating the shaft **44** carrying the drive cam disk **45**. Movably journalled in the bracket **46** is the bolt **47** one end of which is in engagement with the drive cam **45** while its other end engages the name or station identification drum **40**. Rotation of the drive cam **45** causes displacement of the bolt **47** and therewith corresponding motion of the station name drum **40** in the direction of the fixed disk **39**. The bolt **47** will always abruptly return along the transfer portion of the curve of the drive cam **45** allowing the station name drum **40** to return correspondingly into the initial position. The station name drum **40** is in this manner slowly advanced and quickly restored, for example, 16 times per second.

The shaft **36** also drives the belt **48** for rotating the advance spindle **49** which is provided with an annular groove **50** and with the advance thread or spiral groove **51**. The scanning slide **52**, which corresponds to the slide **6** in Fig. 1, is shiftable on the spindle **49**. Upon the slide **52** is disposed a pivoted bracket **53** carrying a grip or latch **54**. The latch **54** engages the advance thread **51** for the time when the scanning slide **52** is within the range of the image drum **38**. The scanning beam of the scanning slide **52** is symbolically indicated by the line **55**. The scanning slide **52** is thus advanced along the image drum **38** during the rotation of the drum. Lifting of the bracket **53** permits shifting of the scanning slide upon the spindle **49** within the range of the station name drum **40**. The latch **54** engages the annular groove **50** and holds the scanning slide **52** in such position relative to the station name drum **40**. The scanning slide **52** thus stands still during the rotation of the station name drum, the latter being separately axially advanced by the operation of the drive cam **45**.

A wedge member **56** extending from the scanning slide **52** lifts the lever arm **58**, pivoted at **57**, from the bolt **47**, during the time when the scanning slide **52** is positioned within the range of the station name drum **40**; but when the scanning slide **52** is brought within the range of the image drum **38**, the wedge **56** will free the lever arm **58** and the spring **59** will displace such lever arm and cause it to engage the annular groove in the bolt **47** at the time when such bolt has reached the end of its advance. The advance of the station name drum **40** is thus stopped.

The operative release of the station identification is effected responsive to the identification call signal which may cause switching in of the scanning signals in the called station. The scanning slide is at such time positioned within the range of the station name drum **40** and the motor **34** is in operation. The station identification call signal also effects over suitable circuit means the actuation of the start magnet **61** which attracts its armature **62** carrying the bracket **62***a* to release the journal bracket **63**. The latter carries an extension **64**, provided with a cutout, and is responsive to such release pulled downwardly by the spring **65**. The cutout in the extension **64** releases the ear **66** which projects from the curve tray **67**. The curve tray **67** is now caused to rotate through the medium of the belt **68**, gear **69**, shaft **70**, gear **71**, shaft **72** and the slip clutch **73**. The rotation of the curve tray **67** is however prevented by the ear **66** in engagement with the extension **64** so long as the journal bracket **63** is held by the armature **62**. The shaft **72** idles in such case with respect to the slip clutch **73**.

The gears **42** and **43** are separated by the downward displacement of the journal bracket **63** and the disk **74** is at the same time brought into engagement with the curve tray **67**. The bearing **75** for the shaft **44** is suspended in universal manner so as to permit the displacement of the shaft responsive to separation of the gears **42** and **43**. The curve tray **67** rotates clockwise and the shaft **44** is accordingly lifted again until the bearing or journal bracket **63** is again latched in engagement with the armature **62** which has meanwhile been released. The gear wheels **42** and **43** now mesh again. The curve tray continues to rotate until its ear **66** engages the extension **64** when it stops.

Upon the shaft **44** is disposed a disk **76** to which is anchored a torsion spring **77** carrying at its free end the annular ringlike member **78**. The latter is engaged by a brake **79**. The disk **76** winds the spring **77** during the rotation of the shaft **44** by the gear wheel **42** until the follower **80** hits the stop **81**. The ringlike member **78** is from this instant on rotated by the disk **76** against the braking action of the brake **79**. The torsion spring **77** unwinds and rotates the disk **76** back to initial position responsive to separation of the gear wheels **42/43** upon actuation of the start magnet **61**. The drive cam **45** is coincidentally also rotated into its initial position—opposite to the direction of rotation indicated by the arrow **82**—until its straight transfer edge engages the bolt **47**. The upper edge of the station name drum **40** is at this instant opposite the scanning beam **55**.

It will be seen from the foregoing explanations that the brief separation of the gears **42/43**, upon receipt of the start signal impulse, always causes displacement of the station name drum **40** into its initial position so that the scanning of the station name can always begin at the upper edge of the corresponding lettering. The station name or identification transmitter may therefore be switched in at any desired instant and the scanning of the name will nevertheless always start at the upper edge of the lettering.

The station name drum will be periodically scanned throughout the operation of the station identification transmitter. However, if it is desired that the station name should be scanned but once, the contact **83** may be suitably connected in the circuit of the scanning element of the scanning slide **52**. The contact **83** will then be actuated by the station name drum **40** always when the drum has reached the end of its slow advance stroke by the action of the drive cam **45**. The face of the drum **40** will press against the contact **83**, actuating such contact which may control a suitable circuit comprising in known manner a relay and such relay, upon energization may control suitable means for stopping the transmission of the station identification. The scanning slide **52** is thereupon manually placed in position within the range of the image drum **38** so as to carry out the symbol transmission.

Assuming that two stations having combined transmitter-receiver apparatus are in communication, the transmitting station will prepare the image drum by placing thereon the desired image or writing. This station thereupon transmits the call signal and a relay, for example, a known frequency responsive relay is thereby actuated in the other station. This latter relay switches in the circuit for its scanning slide **52** and simultaneously closes a circuit for its associated start magnet **61**, and the latter initiates the operation of the station identifier as described before. The corresponding station name is received at the calling station and is recorded. The stop contact **83** terminates the station identifying operation. The calling station now switches in its own station identifying device and after the corresponding scanning of the station name moves its scanning slide **52** into the

range of the image drum **38** whereupon the message transmission begins. Both receivers at the two stations record for control purposes their own station names and transmitted texts. Faulty recording is prevented by known interlock means.

As has been indicated before, the arcuate member **40** forming the station name drum may be formed at a section of the picture image drum **38**. The entire station name drum may, of course, be exchangeable or only the lettering thereon may be exchangeable by suitably securing a strip carrying such lettering.

The above indicated and other modifications and changes may be made within the scope and spirit of the appended claims which define what is believed to be new and desired to have protected by Letters Patent.

We claim:

1. In facsimile telegraph apparatus having an image drum carrying symbols to be transmitted and having a scanning element for scanning said symbols together with means for rotating said image drum and for advancing said scanning element relative thereto so as to scan said symbols for transmission thereof, a station name transmitter comprising an arcuate member carrying separate symbols designating the corresponding station name, means for rotating said arcuate member coincident with the rotation of said image drum, means for causing said scanning element to scan said arcuate member spirally to cause transmission of said station identifying symbols carried thereby, and means independent of said scanning element for axially displacing said arcuate member.

2. The structure and cooperation of parts as defined in claim 1, wherein said arcuate member is arranged upon said image drum.

3. The structure and cooperation of parts as defined in claim 1, comprising means for coupling said arcuate member with said image drum.

4. The structure and cooperation of parts as defined in claim 1, comprising means for exchangeably disposing said arcuate member.

5. The structure and cooperation of parts as defined in claim 1, comprising means for exchangeably disposing said separate symbols on said arcuate member.

6. The structure and cooperation of parts as defined in claim 1, comprising a rotating drive cam for periodically axially reciprocating said arcuate member.

7. The structure and cooperation of parts as defined in claim 1, comprising means for arresting the advance of said scanning element for scanning within the range of said axially displaced arcuate member.

8. The structure and cooperation of parts as defined in claim 1, comprising a spindle for advancing said scanning element, an annular groove and a spiral groove being respectively formed in said spindle, and a latch member coacting with said scanning element for respectively engaging said annular groove or said spiral groove to cause said scanning element to carry out respective scanning of said arcuate member or said image drum.

9. The structure and cooperation of parts as defined in claim 1, comprising means for blocking the advance of said arcuate member, and means for freeing said blocking to cause advance thereof for scanning by said scanning element.

10. The structure and cooperation of parts as defined in claim 6, comprising a start magnet, a start element controlled by said start magnet responsive to a start impulse received thereby, and means controlled by said start element for briefly interrupting the operation of said drive cam.

11. The structure and cooperation of parts as defined in claim 10, comprising a torsion spring for rotating said drive cam into its initial position subsequent to the interruption of the rotation thereof.

12. The structure and cooperation of parts as defined in claim 11, comprising a brake for controlling the operation of said torsion spring.

13. The structure and cooperation of parts as defined in claim 1, comprising contact means in the path of axial displacement of said arcuate member for controlling the termination of scanning thereof by said scanning element.

14. In fascimile telegraph apparatus having a drum for mounting an image to be transmitted and having means for rotating said drum with said image and a scanning element and means for moving said scanning elemen relative to said rotating drum so as to scan such image for the transmission thereof, a station name transmitter comprising an arcuate member carrying a station identifying symbol, means for rotating said arcuate member coincident with the rotation of said image-carrying drum, control means for axially displacing said arcuate member during the rotation thereof, means for positioning said scanning element for scanning said arcuate member for the transmission of said station identifying symbol carried thereby, and means for thereafter positioning said scanning element for displacement relative to said drum to scan the image carried thereby for the transmission of said image.

15. The structure and cooperation of parts as defined in claim 14, wherein said control means comprises a drive cam and a drive means for rotating such cam to displace said arcuate member axially periodically relatively slowly from an initial position to a predetermined axial advance position and abruptly back to its initial position, a start magnet for receiving a start signal impulse, means controlled by said start magnet responsive to the receipt of said start signal impulse for interrupting the drive means for rotating said drive cam, means for thereafter restoring the drive means for continuing the rotation of said drive cam, and means actuated during the interval of interrupted rotation of said drive cam for rotating such cam to move said arcuate member into a predetermined axial start position relative to said scanning element to initiate scanning of said station identifying symbol carried by said arcuate member.

16. The structure and cooperation of parts as defined in claim 15, comprising spring means for biasing said arcuate member in the direction of its normal axial position, an intermediate element disposed between said drive cam and said arcuate member and actuated by said drive cam for axially displacing said arcuate member, and means controlled by said scanning element for locking said intermediate element to inhibit axial displacement of said arcuate member in a predetermined position of said scanning element.

17. The structure and cooperation of parts as defined in claim 15, wherein said drive means comprises a motor-driven gear wheel and a gear wheel driven thereby, the means controlled by said start magnet being effective to disengage said gear wheels for interrupting the rotation of said drive cam, a motor-driven restoring cam for thereafter causing reengagement of said gear wheels to continue the rotation of said drive cam, means controlled by said restoring cam for rotating said drive cam in opposite direction during the interval of its interrupted operative rotation, and torsion spring means wound during the rotation of said drive cam into opposite direction for subsequently placing said cam into initial angular position to displace said arcuate member to its initial normal axial position for scanning by said scanning element.

18. The structure and cooperation of parts as defined in claim 15, comprising a spindle for advancing said scanning element relative to said image-carrying drum, and manually operative means for placing said scanning element in position for scanning said arcuate member or said image on said drum, respectively.

19. The structure and cooperation of parts as defined in claim 18, comprising a latch member, a spiral groove and an annular groove being respectively formed on said

spindle, means for disposing said latch member in engagement respectively with said annular groove or said spiral groove, said scanning element standing still when said latch member is in engagement with said annular groove adapting said scanning element to scan said arcuate member while such member is axially displaced by said drive cam while being axially displaced relative to said image on said rotating drum when said latch member is

in engagement with said spiral groove so as to adapt said scanning element to scan said image on said drum.

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