July 4, 1961 K. WEBER 2,991,330

TELEPRINTER RECEPTION SYSTEM FOR MULTICHANNEL OPERATION

Filed March 27, 1958 2 Sheets-Sheet 1

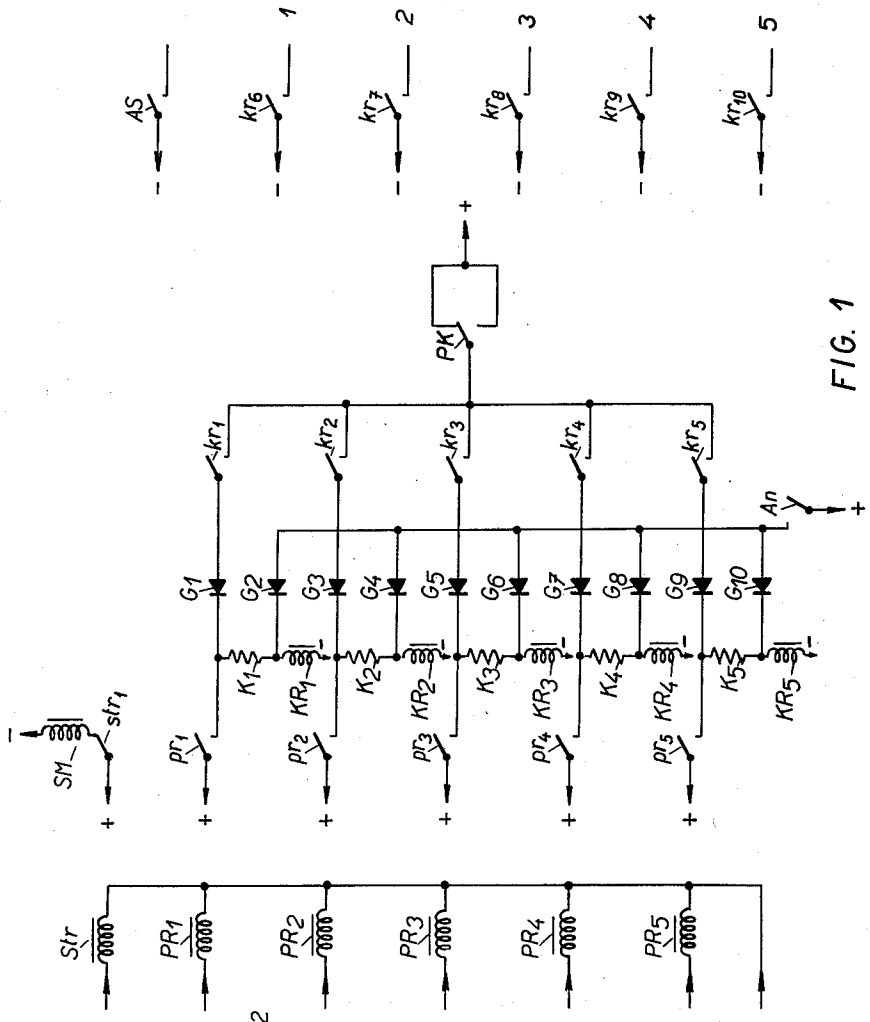

FIG. 1

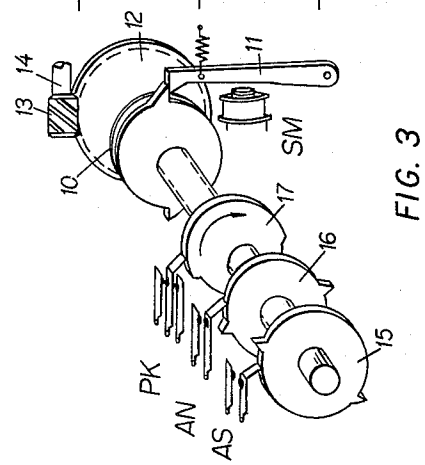

FIG. 3

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TELEPRINTER RECEPTION SYSTEM FOR MULTICHANNEL OPERATION

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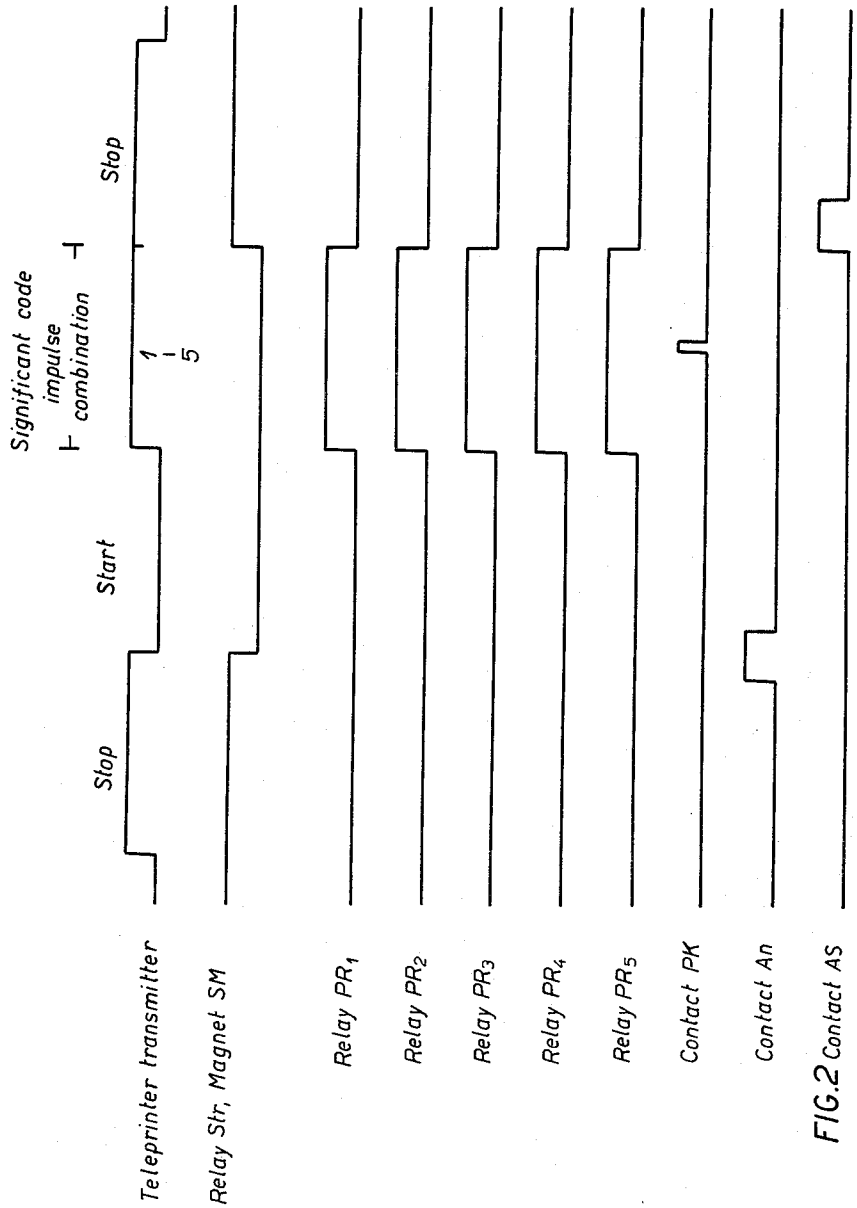

FIG. 2

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TELEPRINTER RECEPTION SYSTEM FOR MULTICHANNEL OPERATION

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1 Claim. (Cl. 178—50)

This invention relates to a teleprinter reception system for multichannel operation in which the entire group of significant code elements, i.e. the letter or sign impulses are transmitted simultaneously.

It is known to transmit simultaneously an entire group of significant code elements whose combination forms a given letter or sign in the teleprinter code. This group is preceded by a start impulse and followed by a stop impulse. Simultaneous transmission is possible regardless of the number of impulses in the said group. This is made possible by the fact that each of the said significant code impulses is passed through a separate path of identical design between the transmitter and the receiver. In this way teleprinter operation can be increased to such an extent that this method appears advantageous in spite of the fact that the necessary equipment, particularly the receiver, is somewhat more complicated. The receiver may be of normal design except for the fact that the device for receiving successively the individual impulses, comprising usually an electromagnet the armature of which controls a known mechanism with a so called sword lever or a similar mechanism, is arranged separately for each of the five transmission paths so that the receiver reads the whole impulse code simultaneously either by printing on paper or by perforating a tape.

The said separate paths for transmitting the significant code impulses consist either of separate wire lines, or channels transmitted over a single line or a wireless transmission path.

This present invention relates to a reception system for such multichannel operation over wire lines or wireless paths. The invention simplifies considerably the receiving mechanism of such systems.

In the teleprinter reception system for multichannel operation the individual paths or channels for the individual significant code combination impulses which are transmitted together, are connected to an equal number of individual polarisation relays. Those of the polarisation relays which receive current impulses close first holding circuits of respectively coordinated combination relays whose second holding circuits are closed by means of a contact controlled by a cam system which is set into rotation by connection with a continually rotating shaft, this connection being effected by an electromagnet excited in response to the start impulse, the said cam system controlling also for a short time, for example 1.7 msec., a change-over contact connected in the said second holding circuits, so that if these circuits are broken when the said contact is changed over, those of the combination relays whose first holding circuits are not also closed, are released, whereby the received impulse combination is registered. This registration is then transmitted through a contact system to a printing or perforation device which is set into action by means of a contact which is also actuated by the said cam system.

The invention will be best understood from the following specification to be read in conjunction with the accompanying drawing in which:

FIG. 1 illustrates the more important parts of the circuit diagram of the receiving device according to the invention, and

FIG. 2 shows the shape of the impulse at various significant points of the device.

FIG. 3 shows the cam system of the invention in perspective view.

If the remote teleprinter transmitter is in the rest position when a stop impulse arrives, the armature of the polarised telegraph relay *Str* at the receiving end is in the position shown in FIG. 1 and current flows through the electromagnet SM. When this magnet is actuated, the cam system of the receiver shown in FIG. 3 is blocked and cannot be rotated by the frictional felt coupling **10**.

When the remote teleprinter transmitter transmits the start impulse, the position of the armature of the relay *Str* is changed over, the contact str_1 interrupts the current in the electromagnet SM, and the armature **11** of this magnet is released. This causes the release of the said frictional felt coupling **10**. A worm gear **12** meshing with a worm **13** mounted on a permanently rotating shaft **14** starts rotation of the cams **15**, **16**, and **17** of the receiver respectively controlling a read-out switch *As*, a master energizing switch *An*, and a master holding switch PK which has two closed positions and is momentarily opened during movement between the two closed positions.

The master energizing switch *An* actuates five combination relays KR1 to KR5 which have respective contacts in the following first holding circuits:

+, PK, kr_1 to kr_5, diode G1, G3, G7, G9, resistor K_1 to K_5, relay KR_1 to KR_5, . . .

Now, if there arrive significant code impulses from the remote teleprinter transmitter, the polarised relays PR_1 to PR_5 are affected dependent on whether current impulses or currentless impulses arrive. The current impulses close the contacts *pr* and thus prepare the second holding circuits:

+, *pr* . . ., resistor K . . ., relay KR . . ., —.

The contacts of the relays PR which are not closed do not form a second holding circuit.

In the center of a significant code impulse the rotating cam **17** switches the contact PK over. This contact is open during switching over for approximately 1.7 msec.

The relays KR the second holding circuits of which are not closed by the contacts *pr* are released due to the short current interruption. The other relays KR are not released because the second holding circuit is arranged in parallel with the first holding circuit. In this manner the receiver registers the entire code combination.. The cam **15** then closes the read-out switch AS and controls the relevant printing device.

The shapes of the impulses at various points in the receiver are illustrated in FIG. 2.

When the teleprinter transmitter reaches again its stop position, the receiver changes over again its relay *Str* and the magnet SM stops again the cam system.

The set contacts kr_6 to kr_{10} of the relays KR transmit the signal for printing.

Due to the fact that the relays KR are released within a very short time /below 0.5 msec./, the receiver can perfectly write the received impulses in spite of their considerable distortion.

In this multichannel receiver, international requirements relating to an impulse speed of 50 bauds can be perfectly met. Due to this fact, such a teleprinter receiver may be employed in connection with all existing transmission systems without any changes. Another advantage of the invention resides in the fact that the present writing speed of 400 to 500 letters per minute can be increased to 1000. It is also possible to effect further

transmissions by connecting further contacts to the combination relays KR.

What I claim is:

In a receiver arrangement for a multi-channel teleprinter controlled by a plurality of impulses simultaneously transmitted over respective transmission channels; the combination of a plurality of polarization relays each associated with a respective one of the transmission channels and being controlled by impulses arriving at the receiver over said respective transmission channel, a plurality of storage relays each associated with a respective one of said polarization relays, an energizing circuit for each of said storage relays, a master energizing switch simultaneously controlling the energizing circuits of all of said storage relays, a first holding circuit for each of said storage relays, a master holding switch interposed in said first holding circuit of each of said storage relays and adapted to simultaneously interrupt all of the first holding circuits upon momentary opening of said master holding switch, each of said polarization relays having an individual holding contact which is closed upon reception of an impulse by the respective polarization relay, a second holding circuit for each of said storage relays having said individual holding contact of the respective polarization relay interposed therein so that said second holding circuit is operative only during reception of an impulse by the respective polarization relay, a plurality of connecting circuits for operating corresponding elements of an information recording device and each associated with a respective one of said polarization relays, each of said storage relays having a signal contact interposed in the respective connecting circuit to complete the latter only when the storage relay is energized, a read-out switch operative, when closed, to cause the simultaneous transmission of impulses through all of said connecting circuits which are then complete by closing of the related signal contacts, and cam means operative to successively close said master energizing switch, momentarily open said master holding switch during the reception of impulses by selected polarization relays so that only the second holding circuits of the storage relays corresponding to said selected polarization relays are then operative, and finally to close said read-out switch for the simultaneous transmission of impulses through the connecting circuits corresponding to said selected polarization relays.

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