

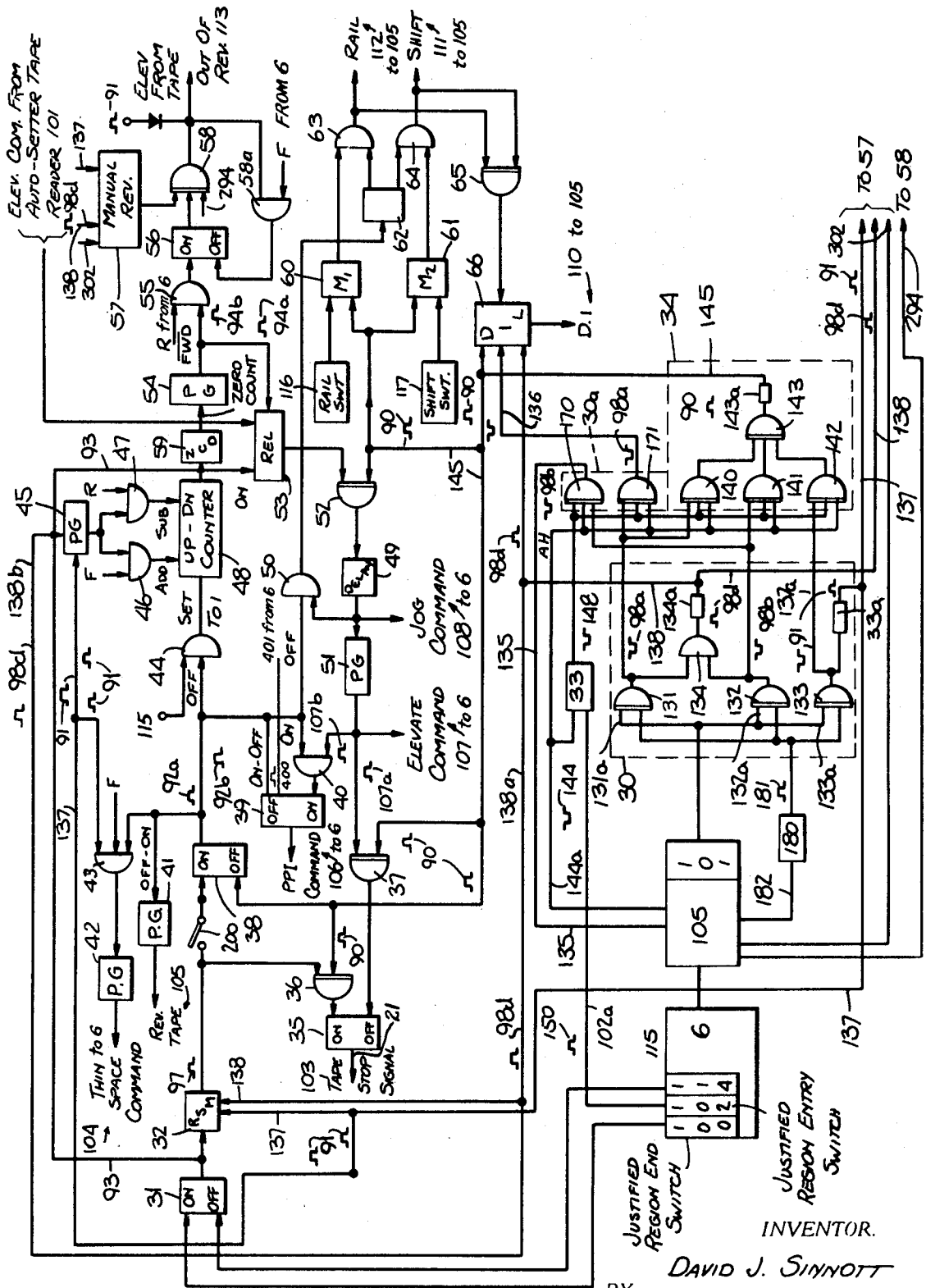
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D. J. SINNOTT

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AUTOMATIC JUSTIFICATION OF LINE-CASTING MACHINE

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INVENTOR.

DAVID J. SINNOTT

BY

John F. Hachal

ATTORNEY

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AUTOMATIC JUSTIFICATION OF LINE-CASTING MACHINE

David J. Sinnott, Ringwood, N.J., assignor to Star-New
Era, Inc., South Hackensack, N.J.

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9 Claims 10

ABSTRACT OF THE DISCLOSURE

A line-casting machine is operated by an automatic setting mechanism. The automatic setting mechanism is actuated by a tape reader sensing codes on a tape. An automatic justifying mechanism is also connected to the reader and the automatic setting mechanism for determining if an assemblage of matrices by the line-casting machine is justifiable. The apparatus takes into consideration the completion of a syllable in the justified region that could be hyphenated. Each word is syllabized with a hyphen between the syllables, which is an artificial one. The artificial hyphen is sensed by the tape reader and is applied to the electronic circuit to determine if the assembled matrices will justify. The artificial hyphen is impressed on the automatic setting mechanism only in the justified region.

RELATED APPLICATIONS

This application is a continuation of my copending application Ser. No. 678,324, filed Oct. 26, 1967, and now abandoned. The application Ser. No. 678,324 is related to the applicant's copending application Ser. No. 571,493, filed on Aug. 10, 1966, and entitled "Apparatus for Automatic Justification of Line-Casting Matrices Assembled by a Coded Tape," now Pat. No. 3,466,604. It is also an improvement over Pat. No. 3,208,040 directed to an automatic setting mechanism for line-casting machines.

BACKGROUND OF THE INVENTION

This invention relates to the automatic operation of line-casting machines from coded tapes, and is particularly directed to apparatus determining if a given assemblage of matrices forms a justifiable line of type.

In the apparatus described in the above application an assemblage of matrices is justifiable if in the justified region a word ends, a spaceband is dropped or a hyphen or long dash is the last matrix. If an incomplete word occurs at the end of the justified region then the assemblage is rejected and the tape reversed to the beginning of the assemblage, and the matrices are reassembled with thin spaces added with the spacebands in an attempt to form a justifiable assemblage. This apparatus does not take into consideration the completion of a syllable in the justified region that could be hyphenated and the word continued in the succeeding line.

SUMMARY OF INVENTION

In this invention this inadequacy is overcome by syllabizing each word with a hyphen between the syllables. The tape reader senses this artificial hyphen. The sensed artificial hyphen signal, however, is not applied directly to the electronic automatic setting mechanism automatically operating the line-casting machine, but is applied to the electronic automatic justifying mechanism for automatically determining if the assembled matrices will justify. The artificial hyphen signal is impressed upon the automatic setting mechanism only in the justified region

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so that words are syllabized in the justified region permitting the assemblage to be justified and cast.

An object of this invention is to provide an apparatus that automatically determines if an assemblage of matrices is justifiable and senses hyphen codes between the syllables of coded words and actuates the line-casting machine to automatically syllabize words only in the justified region.

BRIEF DESCRIPTION OF THE DRAWING

The drawing diagrammatically illustrates the automatic justifying mechanism as illustrated in said Pat. No. 3,466,604 and modified to include the improvement of the present invention.

DETAILED DESCRIPTION

The tape reader 101 senses the code on a tape and actuates the automatic setting mechanism 105 which is described in greater detail in U.S. Pats. Nos. 3,207,845 and 3,208,040 which in turn operates the line-casting machine 6. The tape reader 101 also actuates the automatic justifying mechanism over lines 131a, 132a, 133a. Illustrated as part of the line-casting machine 6 are the justified region entry switch 102, the justified region end switch 100 and the autoclear switch 114.

The codes on the tape for the individual matrices, spacebands, hyphens and artificial hyphens produce a signal in the tape reader 101. These codes except for the artificial hyphen are passed on to the automatic setting mechanism 105. The spaceband, hyphen and artificial hyphen are passed to the automatic justifying mechanism as described in said application Ser. No. 571,493 for measuring the number of syllables or length of the assembled line, and in cooperation with the justified region entry switch 102 determining whether a justifiable line of matrices has been assembled. Syllables are used to measure the length of an assembled line rather than the number of letters or a similar unit since the few number of syllables requires a counter with a lower capacity and the appropriate signals indicating an artificial hyphen, and spaceband are readily available.

The input of matrix reader 30 is connected to the tape reader 101 in the automatic setting mechanism 105 to receive tape commands sensed by the tape reader 101 from a coded tape. The matrix reader 30 and the justified region switch 33 are connected in parallel to the justify signal means 34. On the assemblage of matrices entering the justification zone, the justified region switch 33 is operated by the justified region entry switch 102 on the line-casting machine 6 to render the justify signal means 34 responsive to the matrix reader 30. If the tape presents a spaceband code, hyphen code or artificial hyphen code during this time, a justify signal 90 is developed by the justify signal means 34. The justify signal 90 causes (1) the tape stop signal 103 to be produced; (2) a decoder inhibit signal 110 to generated; (3) the rail 60 and shift 61 memories to be activated; (4) a jog command 108 to be generated; and (5) an elevate command 107 to be transmitted to the line-casting machine 6 after the first four operations have been performed.

The output of the justify signal means 34 is connected to the tape control switch 35 through an OR gate 36. The switch 35 is connected to the tape control in the automatic setting mechanism 105 through line 21 and supplies the tape stop signal 103 thereto. When the switch 35 is ON the tape in the automatic setting mechanism 105 is stopped. The justify signal 90 turns the switch 35 to the ON condition until the elevate command 107a is received through OR gate 37 on elevation of the assembled matrices.

It is preferable that a spaceband is not inserted as the last slug in an assemblage. A decoder inhibit signal 110 is created and applied to the automatic setting mechanism 105 to prevent that operation. The justify signal 90 is applied to the decoder inhibit logic 66 indicating that either a spaceband, artificial hyphen or hyphen was read on the tape. This decoder inhibit logic 66 also receives a hyphen/artificial hyphen signal 98d from the matrix reader 30. Absence of this latter signal 98d permits the logic 66 to determine that a spaceband was the slug indicating the presence of a justified assemblage. The signal 110 of the decoder inhibit logic 66 is generated before the automatic setting mechanism 105 causes the spaceband to be dropped from the spaceband box on the line-casting machine 6. The decoder inhibit logic 66 will not generate signal 110 if a hyphen or artificial hyphen matrix determined the presence of a justified assemblage. There is no objection to this matrix being placed at the end of an assemblage.

During the job period if the justified region entry switch 102 opens up, the decoder inhibit signal 110 will not occur, the spaceband will drop, no elevate command 107 will be generated and the tape will provide codes which will begin assembling the matrices for the next word. The line being assembled will not be justifiable until another spaceband or a hyphen or artificial hyphen matrix is sensed by the tape reader 101.

The output of the justify signal means 34 is also connected to the elevate delay circuit 49 through OR gate 52. The elevate delay circuit 49 produces jog command 108 which causes the line-casting machine 6 to physically rock the assembled matrices to ensure that the matrices are properly seated and arranged. The output of the elevate delay circuit 49 when applied through the pulse generator 51 produces the elevate command 107 which is transmitted to the line-casting machine 6. The elevate delay circuit 49 provides time for completing the assembly of the matrices and for the jogging operation. The pulse generator 51 then issues the elevation command 107 to move the assemblage for the casting of the line. Elevate signals 107a, b are also produced at this time.

At the same time that the justify signal 90 is applied to the elevate OR gate 52, it is also applied to the rail 60 and shift 61 memories. The rail 60 and shift 61 memories are connected to the rail and shift switches 116, 117 which are part of the automatic setting mechanism 105 and record whether they are set in the upper or lower rail or the shift or unshift positions. The recording of the positions of these switches 116 and 117 at the end of each assemblage is necessary if the following assemblage of matrices is rejected and the matrices are reassembled.

The output of the pulse generator 51 is also connected to the tape control switch 35 through an OR gate 37. The elevate signal 107a returns the control of the tape to the automatic setting mechanism 105 by turning the tape control switch 35 off. The automatic setting mechanism 105 starts the tape running forward when it determines that the elevation of the assemblage has been completed.

During the assembly of the matrices the up/down counter 48 of the automatic justifying mechanism is activated to count the number of syllables present in a line of given assemblage. Each hyphen, artificial hyphen and spaceband command issued by the tape causes a count of one to be applied to the up/down counter 48. These matrices indicate the beginning or the end of a syllable. The signals 91 and 98d from the matrix reader 30 are applied to the up/down counter 48 through the counter input control pulse generator 45 and the parallel AND gates 46 and 47. Signal 91 or 98d (spaceband, hyphen, artificial hyphen) from the matrix reader 30 triggers the pulse generator 45. The pulse generator 45 in turn produces a single pulse output which will be applied to the up/down counter 48 through the add AND gate 46 when

the tape is moving forward or through the subtract AND gate 47 when the tape is moving in reverse.

The up/down counter 48 is set to a count of one at the start of each assembly. This count indicates the beginning of the first syllable in an assembly. The output of the set OR gate 44 causes the up/down counter 48 to be set to a count of one when the autoclear signal 115 from the line-casting machine 6 is applied at its input. The autoclear signal 115 indicates that elevation of a line is complete and assembly of a new line may begin.

The up/down counter 48 counts the number of syllables in each line so that if an assemblage does not justify and is discarded, the number of syllables that the tape must be reversed is known by the automatic justifying mechanism.

The justify signal 90 of the justify signal means 34 is also applied to the rejustify switch 38 to turn it off. The rejustify switch 38 is turned on when an assemblage fails to justify. The positive step function 92b produced by this rejustify switch 38 shifting from OFF to ON on application of the rejustify signal 97 initiates the automatic justifying mechanism process whereby an unjustified assemblage is discarded and reassembled. If a line fails to justify upon reassembly, a further attempt at justification cannot be made because the rejustify switch 38 will not have been turned off and thus the positive step function 92b will not be produced when the rejustify signal 97 is applied to the rejustify switch 38. The rejustify switch 38 is effectively a counter which limits the automatic justify mechanism to one attempt at justification of a line by reassembly with an altered length.

An assemblage of matrices is unjustified when the matrix reader 30 does not produce a signal by the time the justified region end switch 100 is reached. When the justified region end switch 100 is reached no further matrices can be added and the entire line must be rejected. The justified region end switch 100 on the line-casting machine 6 is connected to the tight line switch 31 which is normally off. The tight line switch 31 when ON applies a signal to the rejustify signal means 32 causing the rejustify signal 97 to be produced. The rejustify signal 97 is applied to the OR gate 36 connected to the tape control switch 35 and turns the switch 35 on to stop the tape as did the justify signal 90. The rejustify signal 97 also turns the rejustify switch 38 on, but only when switch 200 is closed.

The manual switch 200 when open only stops the tape upon creation of a tight line. When the switch 200 is closed, reversing and reassembly will occur on creation of a tight line.

The tight line switch 31 is also connected to the rejustify elevate logic 53 to activate or enable the logic circuit 53 to receive signals from the reassemble pulse generator 54 connected to the up/down counter 48 and from the tape reader 101. The output of the elevate logic circuit 53 causes an unjustified assembly to be elevated.

The rejustify switch 38 is connected to the reversing pulse generator 41 which drives the automatic setting mechanism 105 for reversing the tape as indicated by the symbol R. As the tape is moving in the reverse direction the spaceband, hyphen and artificial hyphen codes are sensed by the matrix reader 30 and applied to the up/down counter 48 as described above. Since the tape is moving in reverse the counts of the spaceband, hyphen, and artificial hyphen codes will be subtracted from the up/down counter 48. When the up/down counter 48 is turned back to zero, the zero count detector 59 produces a signal which is applied to the reassemble pulse generator 54 to produce the reassemble signals 94a, b. Reassemble signal 94a from the output of the reassemble pulse generator 54 is applied to the rejustify elevate logic 53. The rejustify elevate logic 53 is activated by the tight line switch 31 through line 93 and, therefore, the reassemble signal 94a passes through the rejustify elevate logic 53 to the elevate OR gate 52. The output of the

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elevate OR gate 52 triggers the delay circuit 49 whose output applied through the pulse generator 51 is the elevate signal 107a for activating the line-casting machine 6 to clear the unjustifiable assemblage from the assembly carriage. The reassemble signal 94a applied to the elevate OR gate 52 produces the same results as the justify signal 90 when it is applied to the elevate OR gate 52.

The rejustify elevate logic 53 is also connected to the tape reader 101 which controls the automatic setting mechanism 105. The tape reader 101 which controls the automatic setting mechanism 105 also senses the code indicia on the tape when moving in the reverse direction. If an elevate code is on the tape, it will be sensed and a signal will be applied to the elevate OR gate 52 as was the reassemble signal 94a to elevate and eject the unjustifiable assemblage. An elevate code appears on an unprogrammed tap to indicate the end of a paragraph.

The line-casting machine 6 is prevented from casting an unjustifiable assemblage by the pot pump inhibit command 106. The pot pump inhibit command 106 is generated by the pot pump inhibit switch 39. This switch 39 is normally in the OFF condition permitting the line-casting machine 6 to function normally. In the ON condition the switch 39 prevents the line-casting machine 6 from casting a line following elevation. The pot pump inhibit switch 39 is partially activated by the elevate signal 107b. Switch 39 is turned on when, with the elevate signal (107b) and the rejustify signal (92b) present on AND gate 40, a timing pulse 400 on line 401 is received from the line-casting machine 6 telling the pot pump inhibit circuit (not shown) which line to not cast. Without this timing pulse 400 it is possible to turn switch 39 on for the wrong line.

The rejustify switch signals 92a, b are present immediately following the determination that a line has failed to justify. The elevate signals 107a, b are generated when the tape is reversed to the beginning of a line. The reassemble signal 94a is applied to the elevate OR gate 52 through the rejustify elevate logic circuit 53. The pot pump inhibit switch 39 is turned off when the rejustify switch 38 changes from the ON to the OFF condition. This occurs following the justification of a line when the justify signal 90 is applied to the OFF input of the rejustify switch 38.

The rejustify switch 38 is also connected to the rail and shift transfer switch 62 through the transfer OR gate 50. The transfer switch 62 first applies a signal to the rail OR gate 63 and then after a predetermined delay applies a signal to the shift OR gate 64. The application of the switch signals to the two OR gates 63 and 64 allows the information in the rail and shift memories 60, 61 to be transferred to the automatic setting mechanism 105, separately. Reassembly of the rejected line will then be begun with the rail and shift switches 116, 117 of the automatic setting mechanism 105 in the same condition at the start of the rejected line. During transfer of the rail and shift signals 112, 111, the rail and shift signals 112, 111 are also applied through OR gate 65 to the decoder inhibit logic 66 to generate the decoder inhibit signal 110. The decoder inhibit signal 110 is needed to prevent a matrix from being inadvertently requested during the transfer. The rail and shift signals 111, 112 are commands for machine operations and not for a maxtrix and are not inhibited by the signal from the decoder inhibit logic 66.

The reassemble signal 94a, causes the elevate command 107 to be generated and applied to the line-casting machine 6 while signal 94b simultaneously stops the reverse movement of the tape by generating the OUT-OF-REV command 113. The reassemble signals 94a, b are generated when the up/down counter 48 is counted down to zero. This indicates the beginning of the line to be reassembled. The reassemble signal 94b turns the reverse switch 56 on through reverse OR gate 55. The output of the reverse switch 56 is applied to the tape direction circuits of the automatic setting mechanism

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105 through an OR gate 58. The output of the reverse switch 56 is fed back to the reverse switch 56 through OR gate 58a and turns the reverse switch 56 off when the tape forward signal F from automatic setting mechanism 105 is applied. The tape will not start forward until the elevate signal 107a is applied to the tape stop switch 35 thereby returning control of the tape to the automatic setting mechanism 105. When the automatic justifying mechanism is not being used, a justified clamp is applied from the automatic setting mechanism 105 to OR gate 58 on line 294.

A manual reverse circuit 57 is available when the automatic justifying mechanism is not in operation and an enabling signal is supplied by the automatic setting mechanism 105 on line 302 for this purpose. The operator controls the direction of tape movement. When the tape is reversing the operator can request that each spaceband, hyphen and artificial hyphen detected by the matrix reader 30 and supplied on lines 137 and 138 to the manual reverse circuit 57 cause the tape to automatically stop its reverse movement. This capability allows the operator to reverse a tape a syllable at a time.

The rejustify switch 38 remains on throughout the reassembly of a line. The rejustify switch signal 92a is used to activate the thin space OR gate 43. The signal F indicating that the tape is moving forward is also necessary to activate the thin space OR gate 43. The spaceband signal 91 of the matrix reader 30 is the remaining input to the thin space OR gate 43. The thin space OR gate 43 is in turn connected to a pulse generator 42 whose output 104 causes a thin space matrix to be dropped from the line-casting machine 6 magazine. Thus for each spaceband read from the tape during reassembly a thin space will be inserted into the line along with the spaceband. This expands the space between the words, thereby imparting a different length to the line. This length may justify. If the reassembled matrices are justifiable, the elevation signal 107a is generated and the assemblage is elevated for casting. The justify signal 90 from the justify signal means 34 turns the rejustify switch 38 off completing the rejustification operation. The automatic justifying mechanism and automatic setting mechanism 105 then proceed to assemble the next line of matrices.

If the reassembled matrices fail to justify, the rejustify signal 97 is ineffective except to stop the tape since the rejustify switch 38 will already be on. As previously described, the rejustify switch 38 only actuates the reverse tape pulse generator 41 when it is turned from off to on. Since the tape is not reversed, no signal is produced by the rejustify elevate logic 53 to jog and elevate the assemblage. All operations stop and the matrices are manually justified and elevated.

The automatic justifying mechanism described herein is the same as the automatic justifying mechanism set forth in the above referred to related applications except as specifically modified by the following description to produce the artificial hyphen.

Considering the matrix reader 30, the justified signal means 34 and the hyphen/artificial hyphen circuit 30a in greater detail, the matrix reader 30 has a hyphen OR gate 131, an artificial hyphen OR gate 132 and a spaceband OR gate 133. The inputs of these gates 131, 132, 133 are connected to the tape reader 101 by the lines 131a, 132a and 133a, respectively. The OR gate 131 produces a hyphen signal 98a. The OR gate 132 produces the artificial hyphen signal 98b. These two signals 98a, 98b are applied to the AND gate 134 which produces the hyphen/artificial hyphen signal 98d on the line 138 through the inverter 134a. The OR gate 133 produces a negative spaceband signal 91 on line 137a and through the inverter 133a positive spaceband signal 91 on the line 137. The hyphen/artificial hyphen signal 98d is applied by lines 138, 138a, 138b to the decoder inhibit logic circuit 66, the rejustifying switch 32, the pulse gen-

erator 45 and the manual reverse circuit 57. The positive spaceband signal 91 is supplied by line 137 to the manual reverse circuit 57 and to the rejustifying switch 32 and also to the pulse generator 45 for operation as previously described. The timing signal 181 is provided from the automatic setting mechanism 105 through the timing control 180 over line 182 to the input of the OR gates 133, 131, 132. This timing signal 181 delays or inhibits the gates 131, 132, 133 until the memory flip-flops in the automatic setting mechanism 105 are stable.

The outputs of the matrix OR gates 131, 132 and 133 are connected to the OR gates 140, 141, 142 of the justify signal means 34. The inputs of these OR gates 140, 141, 142 are also connected to the justified region switch 33 which is connected to the justified region entry switch 102 on the line-casting machine 6 for activating these OR gates 140, 141, 142 in cooperation with the enable timing pulse 144 provided from the automatic setting mechanism 105 by the line 144a. Thus these gates 140, 141, 142 are responsive to a hyphen, artificial hyphen or a spaceband signal to produce the justify signal 90 through the OR gate 143 and the inverter 143a. The justify signal 90 is applied by line 145 to the decoder inhibit logic circuit 66, OR gate 52, OR gates 36 and 37 and the rejustify switch 38.

The outputs of the hyphen OR gate 131 and the artificial hyphen OR gate 132 are connected to the OR gates 171 and 170, respectively, of the circuit 30a. The inputs of these latter OR gates 170, 171 are also connected to the justified region switch 33 for activation on closing of the justified region entry switch 102. The OR gate 171 passes the hyphen signal 98a over line 136 to the decoder inhibit circuit 66. The artificial hyphen OR gate 170 produces a simulated hyphen signal 98b which is applied by line 135 to the automatic setting mechanism 105 to actuate the automatic setting mechanism 105 so that a hyphen is dropped by the line-casting machine 6 in the justified region. The automatic setting mechanism 105 is not responsive to the artificial hyphen code signal read from the tape by the tape reader 101. Thus this coded signal can only be passed to the automatic setting mechanism 105 through the OR gates 132 and 170. The latter gate 170 is only activated when the justified region entry switch 102 is closed. Thus though each syllable is hyphenated on the coded tape, only those artificial hyphens which occur in the justified region will be applied to the automatic setting mechanism 105 of the line-casting machine 6.

I claim:

1. In an apparatus for automatic justification of a set of matrices assembled on a line-casting machine from codes on an unprogrammed tape comprising first means for determining the justifiability of a set of matrices assembled from codes on an unprogrammed tape and creating a justify signal on completion of a justifiable assemblage, means connected to said first means to receive a justify signal to interrupt assemblage of matrices, means connected to said justifiability determining means and said assemblage interrupting means for creating a signal to elevate a justifiable assemblage in response to a justify signal and commence assemblage of a succeeding set of matrices, the improvement of which comprises: means for assembling matrices on an elevator, a portion of said assembled matrices being in a predetermined justified region, a justified region entry switch to indicate when the assembled matrices reach said justified region, a reader of said coded tape to operate said assembling means, said tape having coded words separated into syllables by artificial hyphen codes and having other terminating matrix codes, receiving means connected to said reader for receiving artificial hyphen and terminating matrix code signals from said reader for

operating the apparatus, preventing means operatively associated with said first means and the assembling means, said preventing means normally preventing passage of an artificial hyphen code signal to the assembling means, said preventing means being responsive to the justified region entry switch to activate said preventing means when the assembled matrices reach the justified region to permit passage of an artificial hyphen code signal to cause the assembling means to drop a hyphen matrix in the justified region to terminate the continued assembly of matrices, additional means connected to said first means and to said justified region entry switch for receiving artificial hyphen and terminating matrix code signals to create a justified signal when an artificial hyphen or other terminating matrix code signal occurs in the justified region thereby causing the elevator to elevate a set of justifiable assembled matrices and commence assembling a succeeding set of matrices, sensing means to sense the absence of an artificial hyphen or other terminating matrix code signal in said justified region, and means responsive to said sensing means for causing the assembled matrices to be re-assembled.

2. An apparatus as set forth in claim 1 wherein means are provided to inhibit casting of an unjustifiable set of assembled matrices.

3. An apparatus as set forth in claim 1 wherein said receiving means has a first gating means for passing the artificial hyphen signal, a second gating means for passing a hyphen signal as one of the terminating matrix code signals, and a third gating means connected to said first and second gating means for producing either an artificial hyphen or hyphen signal within the justified region.

4. An apparatus as set forth in claim 3 wherein a decoder inhibit logic circuit is provided having an output connected to the assembling means and an input connected to said third gating means for creating an inhibiting signal to prevent the dropping of a spaceband as a terminating matrix within the justified region.

5. An apparatus as set forth in claim 3 wherein a counter is provided to count the number of syllables of assembled matrices from artificial hyphen and spaceband matrix codes on the tape and gating means connected to said counter for impressing the artificial hyphen, hyphen and spaceband signals on said counter.

6. An apparatus as claimed in claim 1 wherein means are provided for using spacebands of different size when said assembled matrices are re-assembled.

7. An apparatus as claimed in claim 1 wherein re-assembly preventing means are provided to prevent further re-assembling of said assembled matrices if the matrices are re-assembled in a non-justified manner.

8. An apparatus as claimed in claim 7 wherein said re-assembly preventing means are activated the first time the assembled matrices are re-assembled in a non-justified manner.

9. An apparatus as claimed in claim 1 wherein means are provided to discard the assembled matrices before the matrices are re-assembled.

References Cited

UNITED STATES PATENTS

3,148,766	9/1964	Higonnet et al.	199—18
3,386,552	6/1968	Lorber et al.	197—20
3,439,341	4/1969	Dolby et al.	197—19X
3,466,604	9/1969	Sinnott	99—18UX

ERNEST T. WRIGHT, JR., Primary Examiner

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197—20