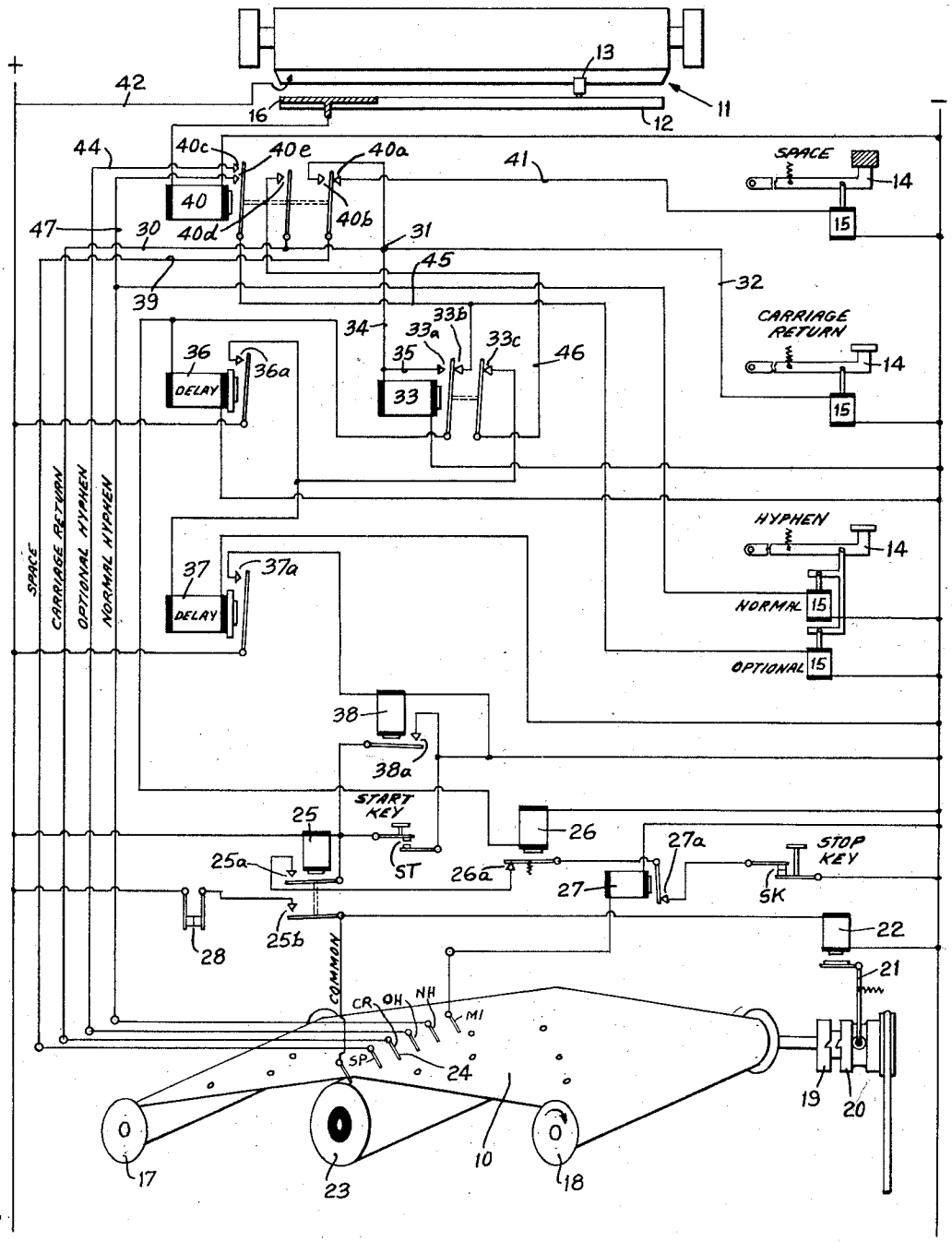
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RECORDING MACHINE

Filed May 14, 1938



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RECORDING MACHINE

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This case relates to automatic writing or data transcribing machines.

One of the problems in the use of a typewriter or the like for transcribing coded designations, such as, for example, derived from a record sheet, is to maintain a substantially even right hand margin on the sheet receiving the transcription. This is particularly the case when provision must be made for interposing or inserting data within the data derived from the coded designations. Such interposed data, for example, may be a manual insertion to be made by the operator. As is known in the art, the record sheet is perforated with the data, known as form data, to control the writing of a plurality of form letters or statements. These form letters may be individualized by inserting or interposing different cities or names within the form data. To enable the insertion to be made, the perforated record usually is provided with a code which interrupts the automatic control of the typewriter. The operator is then enabled to interpose the manual insertion or variable data, following which the operator initiates the resumption of operation of the record sheet to complete its control of the typewriter.

It is apparent that, while the form matter does not differ in length, the manual insertions for different letters may be of considerably different lengths. If the carriage return operation is fixedly controlled by the record sheet to occur at the end of preselected words or characters of the form matter, the manual insertion, being interposed between the automatic reading out of the record designations, may cause the automatic carriage return operations to take place at indeterminable, variable points of the travel of the typewriter carriage so as to result in an uneven or ragged right hand margin.

Furthermore, the body of the form letter may include only one form paragraph or may include a plurality of form paragraphs. In order to present a neat and symmetrical appearance with respect to the length of the letter sheet, the body of the letter should be of substantially the same length irrespective of the number of paragraphs to be written. When only one form paragraph is to comprise the body of the letter, then this paragraph should occupy a greater length than when the same paragraph is to be used in conjunction with one or more other form paragraphs. Previously, the number of lines of typewritten form matter, and, consequently, the length of the form matter has been predetermined by the location of the carriage return codes on the record sheet, so that whether one or more paragraphs were to be transcribed, there was no possibility of varying the length of any paragraph.

The general object of the present invention is to overcome the difficulties presented in the prior art due to the fixing of the length of form matter and the marginal position of such matter by predetermined codes on the record or control sheet.

Further, an object is to cause the automatic transcribing apparatus to prepare a letter or statement, or paper, including both form matter, derived from codes, and interposed matter, such as, for example, a manual insertion, with a substantially even right hand margin regardless of variation in the interposed matter.

It is also an object to provide means for selectively transcribing or not transcribing or transmitting the control of a sensed coded designation.

More specifically, it is intended to provide means for optionally recording or printing or not printing a character designated by a sensed code.

It is also an object to optionally divide or not divide a word at the end of the line; i. e., to print either the entire word or a syllable or syllables thereof, printing the rest of the word on the next line.

Further objects of the instant invention reside in any novel feature of construction or operation or novel combination of parts present in the embodiment of the invention described and shown in the accompanying drawing whether within or without the scope of the appended claims and irrespective of other specific statements as to the scope of the invention contained herein.

In the drawing, the figure is a diagrammatic showing of the transcribing apparatus and control therefor, and including the circuit connections.

The invention is applicable to any known system of transcribing coded designations, whether received or read out from a record card or sheet, through wireless, or an electrical or pneumatic circuit, and to any known system of sensing the coded designations, whether electrical or pneumatic, and to any suitable transcribing, writing, or typing apparatus.

For the purposes of the disclosure, the invention is described and shown herein in connection with electrical means for sensing the codes or designations on a record sheet 10, each character or function being represented by a single hole code along the width of the sheet.

The typewriter carriage and platen are diagrammatically indicated by 11, and a fixed rail of the typewriter is represented by 12. The adjustable right hand margin stop of the typewriter is designated by 13. The typewriter keys are designated by common reference number 14, and only the space, carriage return, and hyphen keys are shown. The keys 14 may be manually operated or automatically operated by magnets or solenoids 15 operatively connected to the keys. Any suitable automatic carriage return mechanism may be operated by the carriage return key, such as disclosed, for example, in Patent 1,955,614.

The right hand margin stop 13 is adjusted in accordance with the approximate desired width of right hand margin. A circuit connection is made to a conductive part of stop 13 and the conductive part rides along the fixed rail 12 as the carriage spaces to the left. Set in the rail 12 is a conductive strip 16 to be wiped by the stop 13 as the carriage reaches a right hand margin zone. The length of this zone is fixed by the length of strip 16, but the location of the zone with respect to the travel of the carriage is variable and depends on the adjustment of stop 13.

Record sheet 10 moves, during its control of the typewriter, in the direction indicated by the arrow, from one roll 17 to another roll 18. The shaft of roll 18 is connected to a clutch disk 19 to be coupled to a drive clutch disk 20 when the clutch lever 21 is rocked clockwise by energization of a clutch magnet 22.

Intermediate rolls 17 and 18 is a contact roller 23 over which the sheet 10 passes. Sensing brushes 24 are provided, one for each designation position along the width of the sheet, but only the brushes necessary to explain the present invention are shown in the drawing. A common brush 24 is also provided to constantly wipe the bare surfaces of the contact roller. When a designation brush senses a perforation, it closes a sensing or analyzing circuit to effect control operations, in a manner which will be explained further on.

Sheet 10 may bear the data for a single paragraph or for a plurality of paragraphs. When a plurality of form paragraphs are provided on sheet 10, suitable means are utilized to select the paragraph or paragraphs to be transcribed. The conventional interpretation of the perforations and the paragraph codes may be indicated on sheet 10 so that any desired paragraph may be manually selected.

To start operations, the operator depresses the start key, establishing the following circuit:

Start key circuit.—From the right side of the line, through start key contacts ST, relay magnet 25, to the left side of the line.

Magnet 25 closes relay contacts 25*a* and 25*b*. The closure of contacts 25*a* shunts the start key contacts ST, and establishes the following holding circuit:

Start holding circuit.—From the left side, through coil 25, contacts 25*a*, normally closed relay contacts 26*a*, normally closed contacts 27*a*, stop key contacts SK, to the right side.

The closure of contacts 25*b* establishes the clutch magnet circuit as follows:

Clutch circuit.—From the left side, through safety or interlock contacts 28, relay contacts 25*b*, and clutch magnet 22, to the right side.

Clutch magnet 22 now couples clutch disk 20 to drive clutch disk 19, causing roll 18 to rotate and feed record sheet 10.

According to the present invention, the carriage return or line space, and consequently, the right hand margin, may be under control not only of the usual carriage return code, but also under selective control of one or more other selected codes. The latter codes may be referred to as the selective line space control codes or as the special, or optional, or supplementary line space or carriage return codes. The special codes include the word space or intraline space code, the normal hyphen code, and the optional hyphen code. The normal hyphen code is used in hyphenating words, such as anti-aircraft. The optional hyphen code is used in separating syllables of a word.

In preparing a record sheet 10 to utilize the supplementary carriage return codes, the form matter to be perforated in the tape is first written out for the guidance of the punch operator, with indications for the insertion of the optional hyphen codes. An example of form matter on a guide sheet given to the punch operator is as follows:

> (*) Replying to your request, we are sending a price list and de-scrip-tion of the part of our stock in which you will proba-bly be most inter-est-ed. In this se-lec-tion we hope you will find an arti-cle which will satis-facto-ri-ly meet your re-quire-ments for pre=war stamps.(C.R.)

The asterisk in parenthesis indicates the beginning of the paragraph, and the punch operator accordingly punches a carriage return code to insure the typewriter carriage returning from its previous position to the beginning of the next line. The next punching is of a tabulating code to effect a paragraph margin spacing. The letters, hyphens, and space codes are then punched as indicated. The single hyphen or dash between syllables of words indicates the punching of optional or special hyphen codes. The double dash or = sign, as in pre=war indicates the punching of a normal hyphen code. The "C.R." in parenthesis at the end of the paragraph indicates a carriage return code.

Having punched the above form matter in the record sheet, the latter is now delivered to the typewriting department to be transcribed. Before transcribing the illustrative form paragraph from the perforations in the record sheet, the operator sets the left hand margin stop (not shown) and the right hand margin stop 13. The wider the margins, the fewer are the number of characters and words which may be typed along one line. Thus, the form paragraph would occupy a greater number of lines as the width of the margin was increased. If the form paragraph is to be the entire body of the letter, the number of lines or the length of the paragraph should be sufficient to occupy a substantial portion of the length of the letter sheet. If the form paragraph is to be used in conjunction with other paragraphs to provide the body of the letter, the form paragraph should occupy a fewer number of lines and occupy a smaller portion of the length of the letter sheet. Accordingly, the operator preliminarily sets the margin stops in accordance with the number of lines or length of the sheet the form paragraph should occupy. The adjustment of the right hand margin stop, in conjunction with conductive strip 16, determines the location of the right hand margin zone, along any escapement step or point of which the special, supplementary, or optional carriage return codes become effective to cause a carriage return and incidental line spacing operation.

To illustrate the flexibility of the machine in transcribing the same form matter with different margins and different lengths, two examples of typing of the form matter previously described as on the guide sheet given to the punch operator and which has now been punched in coded form in the record sheet, are given below. For convenience in designating these examples, they are numbered (1) and (2) and to indicate the beginning of the right hand margin zone, colons are placed above and below each paragraph. It is to be understood, however, that neither the colons nor the designations (1) and (2) are actually typed. The examples follow:

(1).

:

Replying to your request, we are sending a price list and description of the part of our stock in which you will probably be most interested. In this selection we hope you will find an article which will satisfactorily meet your requirements of pre-war stamps.

:

(2).

:

Replying to your request, we are sending a price list and description of the part of our stock in which you will probably be most interested. In this selection we hope you will find an article which will satisfactorily meet your requirements of pre-war stamps.

:

The operations performed by the transcribing apparatus will now be explained in connection with the above examples. In both examples, the first code sensed is a normal carriage return code. The sensing of this code by brush **24**–CR establishes the following circuit:

C. R. code circuit.—From the left side, through safety contacts **28**, relay contacts **25***b*, common brush **24**, contact roller **23**, brush **24**–CR, (now engaging through the carriage return perforation with roller **23**), the carriage return wire **30**, terminal **31**, line **32**, carriage return solenoid **15**, and to the right side.

Energization of solenoid **15** depresses the carriage return key **14** to effect carriage return operation, as an incident to which a line spacing operation occurs, as usual.

Simultaneously with formation of the C. R. code circuit, the following circuit is formed:

Relay coil 33.—Beginning as in the above circuit, to terminal **31**, then proceeding through line **34**, through coil **33**, and to the right side.

Energization of coil **33** closes relay contacts **33***a*, forming the following circuit:

C. R. stop circuit.—Beginning as in the preceding circuit, then from line **34** through line **35**, relay contacts **33***a*, slow relay coil **26**, and to the right side.

Energization of coil **26**, after a slight lag, opens contacts **26***a* in the start holding circuit, thereby deenergizing relay coil **25** and causing contacts **25***b* in the clutch circuit to open and deenergize clutch magnet **22**. As a result, clutch disks **19** and **20** are uncoupled, causing the record sheet **10** to stop feeding.

As a further result of closure of relay contacts **33***a*, the following circuit is formed:

Delay coil 36.—As in the preceding circuit, then, from contacts **33***a*, through delay coil **36**, and to the right side.

Energization of coil **36**, after a slight delay, effects closure of its relay contacts **36***a*. Closure of contacts **36***a* forms the following circuit:

Delay coil 37.—From the left side, through points **36***a*, and delay coil **37**, to the right side.

Delay relay **37** is designed to close relay points **37***a* after an interval greater than the maximum length of time which the carriage may possibly take to return to the beginning of the next line. Delay relay **36** is so designed as to make contacts **36***a* after a slight delay, but before the relay contacts **25***b* are permitted to open, for a reason which will appear later, and also to retard the opening of these contacts **36***a* for the maximum carriage return interval, so as to maintain a circuit through delay coil **37** long enough for the latter to close its relay points **37***a* at the end of the maximum carriage return interval. Thus, by the time contacts **37***a* have closed, the carriage has returned to the beginning of the next line. The closure of contacts **37***a* completes the following circuit:

Delay start circuit.—From the left side of the line, through points **37***a*, relay coil **38**, to the right side of the line.

Coil **38** now closes its relay points **38***a*, shunting the start key contacts ST, so as to close the circuit of coil **25** which, in turn, closes contacts **25***a* to form the holding circuit of the latter coil, and also closes contacts **25***b* to again energize the clutch magnet **22**. The record sheet **10** now resumes feeding.

The operation of the machine under control of the first carriage return code has been explained. The next code is a tab code for controlling tabulating operation of the typewriter carriage to effect the paragraph margin spacing. The control of the typewriter by the tab and character codes is effected in the usual manner and need not be explained herein. When the carriage has not yet reached the right hand margin zone, the sensing of a word space code closes the following circuit:

Intermediate space circuit.—From the left side, through contacts **28**, relay contacts **25***b*, common brush **24**, contact roller **23**, the space code sensing brush **24**–SP, space line **39**, normally closed relay contacts **40***a*, line **41**, through the space bar solenoid **15**, and to the right side.

Energization of space solenoid **15** depresses the space bar to effect the normal intraline or word spacing operation of the carriage.

In Example (1), the right hand margin stop **13** has been adjusted to reach conductive strip **15** as the carriage escapes following the printing of the comma at the end of line 1. The carriage is then in the right hand margin zone, as indicated by the colons above and below the paragraph. Upon the margin stop **13** engaging strip **16**, the following circuit forms:

Margin zone circuit.—From the left side, through wire **42**, through the stop **13**, strip **16**, and relay coil **40**, to the right side. Coil **40** now opens contacts **40***a* so that sensing of the intraline space code will not at this time form the intermediate space circuit. The carriage has now reached the right hand margin zone, coil **40** has been energized, and the next code sensed is a space code. Upon the sensing of the space code at this time, the following circuit is established:

Space code carriage return.—From the left side, through contacts **28**, contacts **25***b*, common brush **24**, contact roller **23**, space code brush **24**–SP, line **39**, relay contacts **40***b* (now closed by energized coil **40**), terminal **31**, line **32**, and through the carriage return solenoid **15**, to the right side.

Carriage return solenoid **15** now depresses the carriage return key **14** to effect a carriage return

operation. Thus, as a result of the sensing of the space code when the carriage is in the right hand zone, intraline spacing is suppressed, and, instead, a carriage return operation is effected. It is clear now that the space code is one of the optional carriage return codes. Just as in the previously described carriage return operation, coil 33 is energized to close points 33*a* which, in turn, close the C. R. stop circuit, through coil 26 to interrupt operation of the record feeding means.

Also, the closing of points 33*a* energizes delay coil 36 to close points 36*a* which remain closed for energizing delay coil 37 to make contacts 37*a* after the carriage return interval so as to restart, then, the feeding of the record tape.

In above manner under control of the right hand margin zone determining means, the intraline space code, instead of effecting the normal intraline spacing, has caused a carriage return operation after the comma at the end of line 1 of illustrative paragraph (1). For Example (2), the right hand stop 13 has been set to begin the right hand margin zone at the letter "*e*" in the last word "price" of line 1. Thus, the operations described above as occurring upon the sensing of an intraline space code following the comma at the end of line 1 of Example (1) take place in regard to paragraph (2) only after the typing of the word "price," line 1.

The typewriter, under control of the record sheet, types the second line of paragraph (1), and at the end of this line, another space code effects carriage return operation. The same thing occurs at the end of lines 3, 4 and 6 of paragraph (1). In typing line 5 of the latter paragraph, the carriage reaches the right hand margin zone immediately after typing the syllable "*se*" at the end of the line, and at this point, the brush 24–OH is sensing an optional hyphen code. In the absence of the optional hyphen code, the next code on the record tape 10 would be the letter "*l*" followed by codes for the remainder of the word "selection." The carriage would then return only after the entire word "selection" had been completely typed in the fifth line. As a result, the word "selection" would extend a considerable distance to the right of the terminal words of the other lines, rendering the right hand margin extremely uneven. In order to avoid this unevenness of margin, syllabification is utilized, with the special optional hyphen codes separating the coded syllables of words on the record sheet 10. The indication for punching of these optional hyphen codes is given to the punch operator in the guide sheet of the illustrative form paragraph by hyphens, although it is clear that any other symbol may be used. In separating the syllables of the words of the form matter, the words which would in all cases be wholly typed on the first line are not separated into syllables by the optional hyphen codes. The other multi-syllable words, as desired and selected by the person preparing the punch guide sheet, are separated into syllables by optional hyphen codes. Should the optional hyphen code be sensed while the carriage is in an intermediate position; i. e., before it reaches the right hand marginal zone, then the sensing of and control by the optional hyphen code will be ignored. However, when the carriage is in the right hand marginal zone, the sensing of the optional hyphen code causes the typewriter to print the hyphen and then automatically effect a carriage return operation. For example, in line 5 of paragraph (1) the carriage has reached the right hand marginal zone after the typing of the letter "*e*" in the syllable "*se*" at the end of the line. The next code sensed is an optional hyphen code. Previous to the sensing of this code and as the carriage reached the right hand marginal zone, relay coil 40 had been energized by the previously traced margin zone circuit. Now, when the optional hyphen code is sensed, the following circuit is established:

Optional hyphen printing circuit.—From the left side, through contacts 28 and 25*b*, common brush 24, common contact roller 23, brush 24–OH (sensing the optional hyphen code), optional hyphen line 44, relay points 40*c* (now closed by energized coil 40), line 45, and through the optional hyphen solenoid 15, to the right side.

Energization of the optional hyphen solenoid 15 depresses the hyphen key 14 to cause the typing of a hyphen after the syllable "*se*" at the end of line 5 of paragraph (1).

Simultaneously with the above circuit, a branch circuit is formed from line 45, through normally closed relay contacts 33*b*, and through coil 26 to the right side of the line. Energization of coil 26 opens points 26*a* to cause interruption in feed of record sheet 10, in the manner previously described. Simultaneously, a third circuit is formed through the delay coil 36 which proceeds from the normally closed contacts 33*b* through delay coil 36, to the right side of the line. Energization of coil 36, after a slight lag, closes points 36*a* to effect operation of delay relay 37 in the previously described manner. At the same time the closure of points 36*a* now also forms the following circuit:

Hyphen C. R. circuit.—From the left side through contacts 36*a*, normally closed relay points 33*c*, line 46, relay contacts 40*d* (now closed due to energization of coil 40), line 32, and through the carriage return solenoid 15, to the right side.

Due to the slight lag in closing of points 36*a*, the above circuit does not form until after the hyphen printing circuit, so as to insure printing of the hyphen before the carriage return starts. For some typewriters, the simultaneous depression of a character key and the carriage return key forces the carriage return to be delayed until after printing and then to proceed. For such typewriters, relay 36 may be designed to close points 36*a* without delay.

As a result of energization of carriage return solenoid 15, the carriage return operation, as well as the incidental line spacing, takes place following the typing of the hyphen after "*se*" at the end of line 5 of paragraph (1). The remainder of the word "selection" is printed on the next line after the carriage returns. At the end of the carriage return operation, contacts 37*a* of the delay relay 37 close and restart the feed of the tape 10.

For paragraph (2), the margin stop 13 has been set further to the right so it does not reach strip 16 while the optional hyphen codes for the word "selection" in line 3 of paragraph (2) are passing the line of sensing brushes. Accordingly, the carriage is not then at the right hand margin zone and coil 40 is not energized when the optional hyphens between the syllables of the word "selection" are sensed. Since the coil 40 is not energized, contacts 40c are not made and, therefore, the optional hyphen line 44 is broken at 40c and none of the circuits which were previously described as formed through the optional hyphen code or controlled thereby can now be made. Thus, with the carriage in an inter-

mediate postion and while out of the right hand margin zone, the presence of the optional hyphen code on the record sheet **10** is completely ignored, and the word, the syllables of which have been separated by the optional hyphen codes, is typed without the hyphens. The setting of stop **13** for the typing of paragraph (2) is such that the right hand margin zone is reached as the carriage escapes after typing of the letter "*c*" in the word "price" in line 1 of the latter paragraph. Thus, after the word "price" has been typed, a space code will be sensed, causing a carriage return operation in the previously described manner. The same thing will occur after the typing of the word "which" at the end of line 2 and after the word "selection" in line 3. After the typing of the portion "satisfacto" (of the word "satisfactorily") at the end of line 4, the carriage is in the right hand margin zone. The next code sensed is an optional hyphen code which, in the same manner as described before, causes the typing of the optional hyphen and the carriage to return to the beginning of the next line. In paragraph (1), the word "satisfactorily" automatically is divided as "satisfactori-ly," the former portion occurring at the end of line 7 and the latter portion at the beginning of line 8.

During the typing of example (1), the normal hyphen, designated by = in the punch guide sheet, and hyphenating the word "pre-war" is sensed while the carriage is in the right hand margin zone, and therefore relay coil **40** has been energized. Accordingly, the following circuits are established:

Normal hyphen printing circuit.—From the left side, through contacts **28** and **25***b*, common brush **24**, contact roller **23**, normal hyphen sensing brush **24**–NH, the normal hyphen line **47**, through the normal hyphen solenoid **15**, and to the right side.

As a result of the energization of the normal hyphen solenoid **15**, the hyphen key **14** is depressed causing the printing in paragraph (1) of the hyphen at the end of line 8 following the prefix "pre." Due to the carriage being in the right hand margin zone, coil **40** has been energized and relay contacts **40***e* have been made. Consequently, a circuit is formed which begins as in the preceding circuit and branches off from the normal hyphen line **47** through the closed contacts **40***e*, through line **45**, contacts **33***b*, through relay coil **26**, and to the right side. At the same time, a branch circuit is formed from contacts **33***b* through the delay coil **36** to the right side of the line. As before, due to energization of coil **26**, contacts **26***a* open and break the holding circuit of relay **25** which in turn breaks the circuit of the clutch magnet **22** to interrupt feed of the record sheet. The circuit through delay coil **36** causes the relay points **36***a* to make after a slight lag sufficient to permit the printing of a hyphen before the carriage return starts. The closure of points **36***a* forms the hyphen C. R. circuit, previously traced in connection with the optional hyphen controls. Consequently, a carriage return operation is effected following the printing of a normal hyphen after the prefix "pre" at the end of line 8 of paragraph (1). The making of points **36***a* also causes energization of coil **37** which closes points **37***a* after the carriage return interval so as to restart feed of the tape. The machine now types the part "war" of the hyphenated word "pre-war." After the typing of the period at the end of line 9, a normal carriage return code is sensed causing the normal carriage return operation.

During the typing of paragraph (2), the normal hyphen in "pre-war" is sensed with the carriage external to the right hand margin zone. Consequently, relay **40** is not energized, contacts **40***e* are still open, and the normal hyphen code does not cause a carriage return operation.

The operation of the machine in transcribing the coded paragraph designated on sheet **10** into the form indicated by paragraphs (1) and (2) has been explained. A comparison of these paragraph examples shows that example (1) occupies nine lines and has wide margins, while example (2) occupies five lines and has narrow margins. This variation in length and margin of the transcriptions has occurred under control of the optional carriage return codes.

The application of the optional carriage return controls to the maintenance of an even right hand margin for form matter, in which variable matter, not derived from the designations, as, for example, manual insertions, is interposed will now be explained. The manual insertions may differ considerably in length and yet under control of the optional carriage return codes, the right hand margin of the same form matter but with different lengths of insertions will be substantially the same. To explain the utility of the optional carriage return codes in connection with manual or other insertions between form matter, the following two examples, numbered (3) and (4) are given. It is to be understood that the designations (3) and (4) and the colons indicating the beginning of the right hand margin zone are not actually typed. The examples follow:

(3). :

We are sending your order on to our branch in Salem, which is our distribution point serving your territory. Because it is closer, filling your order there will reduce both the time and cost of shipment. :

(4). :

We are sending your order on to our branch in Kingston, Ontario, Canada, which is our distribution point serving your territory. Because it is closer, filling your order there will reduce both the time and cost of shipment. :

The underlining in above examples denotes the manually inserted matter, and it is to be understood that the underlining is not actually typed.

The marginal stops having been set, the transcribing operation proceeds in the manner explained before. In both of the above examples, the optional hyphen code causes the word "order" to be hyphenated, with "or" at the end of line 1. For both examples, the typing proceeds normally until after the space code has caused an intraline spacing after "in" of line 2. The next code sensed is a manual insert code, the sensing of which by brush **24**–MI forms the following circuit:

Manual insert stop circuit.—From the left side, through contacts **28** and **25***b*, common brush **24**, contact roll **23**, brush **24**–MI, coil **27**, and to the right side.

Energization of coil **27** opens its points **27***a* in the holding circuit of relay **25**, thereby interrupting feed of the record sheet. The operator now manually operates the typewriter to insert the name of the city, which for paragraph (3) is "Salem" and for paragraph (4) is "Kingston, Ontario, Canada." Having finished the typing of the manual insertion, the operator depresses the start key to close contacts ST and restart automatic transcribing operations. Comparing

paragraphs (3) and (4), it will be seen that due to the variations in length of the different manual insertions, the carriage reaches the right hand marginal zone for these paragraphs while typing different words or portions of the form matter. Thus, for paragraph (3), the right hand zone is reached during the typing of the word "point," line 3, "Because," line 4, "order," line 5, and "time," line 6. After the typing of these words, a space code causes carriage return operations, as previously explained. For paragraph (4), the same right hand margin zone is reached while typing syllable "dis," line 3, syllable "ter," line 4, syllable "fill," line 5, the word "reduce," line 6, and after the typing of the syllable "ship," line 7. Under control of the optional hyphen codes, sensed following the typing of these syllables, and under control of the space code following "reduce," line 6, the carriage return operations are effected in the manner described before.

It may be seen from the comparison of paragraphs (3) and (4) that in spite of considerable difference in length of the manual insertions, the same right hand, substantially regular or even margin is preserved for both paragraphs without requiring the setting of the marginal stops to be changed in the slightest.

The preservation of the right hand margin for the form paragraph with manual insertion or interposed matter is particularly important when this paragraph is to be used in conjunction with other paragraphs required to have the same margins.

The machine, as described above, includes means for interrupting the feed of the record sheet during carriage return operations, whether controlled by the normal carriage return codes or by the supplementary or optional carriage return control codes. It is understood, however, that it is not essential to provide means for stopping feed of the record sheet during carriage return operation, as it is well known to provide sufficient time for the carriage to return by adequately spacing the code which initiates the carriage return from the next code on the record sheet. In that case, the sheet would continue to feed interruptedly after a code thereof had caused the carriage return operation, and the next code on the sheet would not reach the sensing line until after a maximum carriage return interval. With provision for delay by adequately spacing the control codes, the stop relay **26** and its circuit, the delay relay **37**, and coil **38** controlled thereby would be unnecessary and could be omitted. Further, the delay relay **36** would merely be designed to provide a slight delay in the making of points **36***a*, which would not have to have a delayed break in order to maintain a circuit through coil **37**, but could break immediately upon the passing of the control code which had resulted in the energization of the delay relay **36**. Moreover, as previously explained, the delay in the making of points **36***a* is not essential when the typewriter has properly designed interlocks delaying carriage return operation until after printing of a character or symbol, even though the carriage return and character or symbol keys be simultaneously depressed.

It is further understood that the printing of the optional hyphen and control of the carriage return by the optional hyphen code may be suppressed, if desired, by disconnecting the brush **24**–OH from the line **44**. Also, control of carriage return by the normal hyphen code may be suppressed by disconnecting line **47** from the wire leading to relay contacts **40***e*. Likewise, control by the space code of carriage return may be suppressed by directly connecting line **35**, without interposition of contacts **40***a* or **40***b*, to the line **41**. Thus, any one or more or all of the optional controls for the carriage return operation may be selectively utilized.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. In a machine including apparatus to write indicia along successive lines of a sheet, means controlled by a codal indication for hyphenating the indicia, means for determining an end margin zone of the writing, the first-named means being ineffective to hyphenate indicia written by said apparatus outside the end margin zone, and means controlled by the zone determining means for rendering the first-named means effective in the end margin zone.

2. In a machine including typing elements to type along a line of a sheet and a carriage for the sheet having intra line movement; means to translate codal indications of matter including means to cause the typing elements to type the matter corresponding to the indications, control means for selectively determining effectivity of the translating means only in the translation of a particular codal indication and in causing the typing of the corresponding matter, and means controlled by the carriage in accordance with its intra line position for governing operation of said control means.

3. In a machine including typing means to type on a sheet, a carriage for the sheet having intra line travel, and means to effect line spacing of the sheet; means to translate a codal indication of matter and including means to cause the typing means to type the said matter, control means for selectively rendering the said translating means effective and ineffective, means controlled by the carriage in accordance with its intra line position for governing effectivity of the said control means, and means controlled by the said translating means, when effective in translating said indication and causing the typing of the corresponding matter, for also operating the line space-effecting means.

4. The machine as defined in claim 3, and a time delay device, included in the means operating the line space-effecting means, to delay the line-spacing until after the typing of the matter corresponding to the codal indication.

5. In a machine including means to write words along successive lines of a sheet and a carriage for the sheet having intra line travel; translating means controlled by a codal indication for operating the writing means automatically to separate a word into spaced parts, control means for selectively determining effectivity of the translating means, and means controlled by the carriage in accordance with its intra line position for governing operation of the control means.

6. In a machine including typing means to type indicia on a sheet and a carriage for the

sheet having intra line travel; means controlled by a hyphen-designating indication for causing the typing means to type a hyphen between indicia, said means being normally ineffective to type a hyphen between indicia typed on certain portions of a line, control means for rendering the indication-controlled means effective, and means controlled by the carriage in accordance with its intra line position for rendering the said control means operable to render the indication-controlled means effective to cause typing of a hyphen between indicia typed on other portions of a line than the first-named portions.

7. In a machine including typing means to type along a line of a sheet and a carriage for the sheet having intra line travel; means controlled by a codal indication for operating the typing means to hyphenate indicia, control means for determining effectivity of the indication-controlled means, and means controlled by the carriage, and arranged to be effective when the carriage is in a predetermined end zone of its intra line travel, for rendering said control means operable to cause the indication-controlled means to be effective under control of the codal indication to cause hyphenation and for disabling the indication-controlled means from hyphenating indicia typed when the carriage is outside the predetermined end zone.

8. In a machine including typing means to type along successive lines of a sheet, a carriage for the sheet having intra line travel, and means to effect line spacing of the sheet; means controlled by a codal designation for operating the typing means to type a hyphen, means controlled by the carriage for selectively determining effectivity of the designation controlled means to cause hyphen typing, and means controlled by the designation controlled means, when effective, for causing operation of the line space-effecting means as an incident to the typing of said hyphen.

9. In a machine including typing means to type along successive lines of a sheet held on a sheet-supporting means and in which the two aforementioned means are mounted for relative intra-line movement during the course of typing along a line and also for relative return and line spacing movements to locate the beginning of a new line in typing position; the combination of means controlled by a codal indication for typing a hyphen, means controlled by the same indication for effecting the relative return and line spacing movements between the typing means and sheet-supporting means as an incident following the typing of the hyphen, control means to selectively render the two indication-controlled means collaterally effective, and means responsive to the relative intra-line movement between the two first-named means for rendering the control means effective only within a restricted zone of each line, within which zone the two indication-controlled means are collaterally effective and outside which neither is effective.

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