

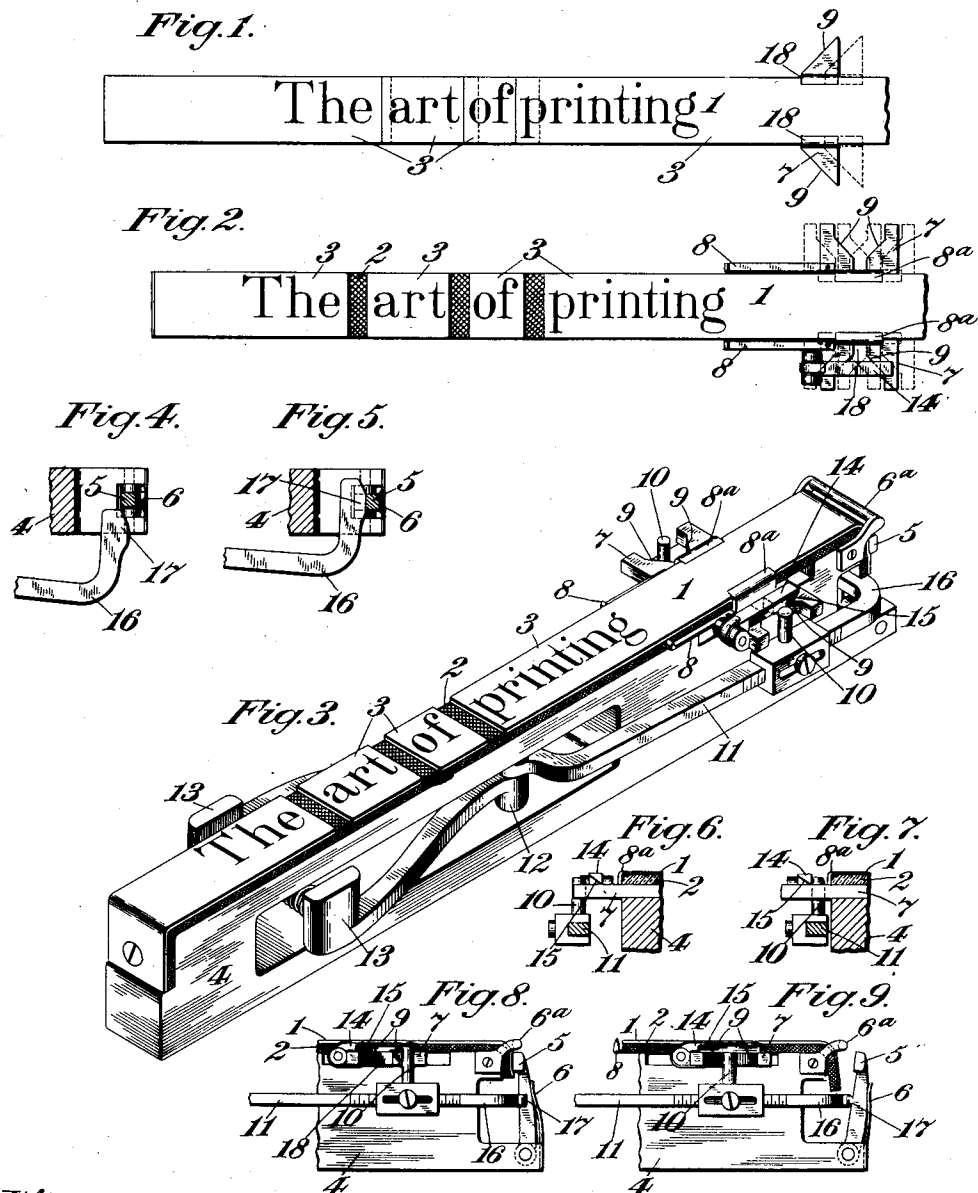
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ART OF PRINTING.

APPLICATION FILED MAY 29, 1905. RENEWED AUG. 12, 1913.

1,093,831.

Patented Apr. 21, 1914.



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UNITED STATES PATENT OFFICE.

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ART OF PRINTING.

1,093,831.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE R. CORNWALL, a citizen of the United States, residing at Rye, in the county of Westchester and State of New York, have invented new and useful Improvements in the Art of Printing, of which the following is a specification.

The invention relates to the art of printing and, more particularly, to that branch of the art wherein matter is composed in lines for the purpose of duplication.

An object of the invention is to produce a justified line without the necessity of previous calculation or of using a preliminary representation; to produce a justified line automatically without regard to the fact that the line which is composed presents either a shortage or surplusage as regards the predetermined measure to which the line is to be justified. These and other objects of the invention will more fully appear from the following description.

The invention consists in the novel improvements, parts, articles and combinations herein shown and described.

The accompanying drawings, referred to herein and forming a part hereof, illustrate one embodiment of the invention the same serving in connection with the description herein, to explain the principles of the invention.

Of the drawings: Figure 1 represents a composed line with means for justifying the line when it is short of the measure; Fig. 2 shows a composed line with means for justifying it when the line is over or under measure; Fig. 3 is a perspective view of a line together with the mechanism for justifying same; and Figs. 4 to 9 inclusive are detail views of various portions of the mechanism.

The invention contemplates the providing of a surface consisting of an elastic and inelastic layer attached together, the elastic layer being continuous and the inelastic layer being discontinuous between groups of characters. By changing the tension of the elastic layer the extent of a line of characters upon the surface may be lengthened or shortened in the spaces between the groups of characters, while the inelastic layer will preserve the portions of the surface bearing such groups of characters from any deformation whatever.

In the embodiment of the invention here-

with illustrated, 1 represents such a surface, same being in the form of a strip bearing a composed line of characters. The said strip consists of two layers of material, one layer, shown herein as 2, being elastic and continuous, the other layer, shown herein as 3, being inelastic and discontinuous between the various groups of characters. While the characters are shown as being carried on the discontinuous layer, it is immaterial whether they be carried thereon or upon the continuous layer.

In the form shown in Fig. 1 the justification of a line set short of the measure only is contemplated, while in the form illustrated in Figs. 2 and 3 justification of a line either long or short is contemplated. In the form illustrated in Fig. 2 the character-bearing strip is shown as mounted upon a support 4 and is held under a certain degree of tension by suitable means such as a clamp 5 which may be made to act automatically by a spring 6. A guide 6^a is shown for holding the strip upon the support. In this form of the invention the inelastic layer 3 is removed between the words or other groups of characters, or after the said layer 3 is cut through, the tension placed upon the elastic layer 2 is such as to appreciably separate the various portions of the layer 3 bearing the words or groups of characters. The locating member designated generally as 7 is attached to the strip in a fixed relation to the end character of the line, proper means for so locating it being shown herein as 8, and means for attaching said locating member to the strip being shown as 8^a. Means are provided for changing the tension of the elastic layer 2, or, in other words, for elongating or shortening the character-bearing strip by elongating or shortening the elastic layer which is capable of such action in the interverbal spaces but is restrained therefrom in the parts in contact with the inelastic layer. By this action the line is brought to the predetermined measure or justified. For this purpose the member 7 is provided with parts adapted to cooperate with suitable mechanism to accomplish this end. The said means are herein illustrated as cam faces 9. The mechanism for cooperating with the member 7 in the justifying action is shown as movable members in the form of pins 10. These pins 10 moving inwardly, coact with a cam face 9 and the

parts are so proportioned and arranged that when the pin has reached the inward end of the cam face the last letter of the line has just filled the predetermined measure and the line is justified. The pin 10 is herein shown as adjustably carried upon pivoted arms 11, which arms may be conveniently mounted upon the support 4. The arms 11 are shown as pivoted at 12 and having finger pieces 13 at the opposite end for actuating them. Means for holding the locating means 7 and the actuating means 10 therefor in a definite relation after the act of justifying the line has been consummated are provided. Mounted upon the member 7 is a latch 14 having an inclined face 15 which, as will be seen, permits movement of the pin 10 past the latch in one direction, but prevents such movement in the opposite direction. When the above described mechanism for changing the tension of the elastic member 2 is about to act it is necessary that the means for holding the member 2 under its preliminary tension should be put out of action. Such means are herein shown as an extension 16 of one of the pivoted arms 11 which is provided with a cam face 17 adapted, as the lever is actuated, to swing past the clamping member 5 and to throw same off the strip as clearly shown in Figs. 4, 5, 8 and 9.

In the mechanism herein illustrated as embodying the invention, the strip 1 may be placed under tension before the line is composed thereon, or may be placed under tension thereafter. The member 7 is then attached to the strip in a predetermined relation to the end character of the line, which may be done by means of the device 8. The members 11 may then be actuated by pressure upon the finger pieces 13, whereupon the opposite ends will pass inwardly, and the cam 17, unclamping the bar 5, will cause the cam face 9 to come in contact with the pin 10, the pin 10 then passing inwardly to the straight recessed portion 18, the latch 14 lifting to allow the pin 10 to pass. The recess 18 serves with the pin 10 to hold the strip 1 in place in its justified position. The parts are so proportioned and adjusted that when the pin 10 is in the recessed portion 18 the end character in the line will be brought to the predetermined measure and the line justified. The reach of the opening in the member 7 is such as to include the maximum shortage or surplusage of a full composed line, so that the pin 10 will always be within the said opening. The finger pieces may be released, if desired, but the latch 14 will hold the pins 10 in their recesses 18 and will maintain the line to the predetermined measure until it has been reproduced by some suitable process.

The application of the invention to the form shown in Fig. 1 will be manifest from

the foregoing, the principal difference in the two forms being that in the form shown in Fig. 1 the elastic layer 2 need not be placed under preliminary tension and the form is adapted for justifying the line having a shortage only. The character-bearing surface of the strip 1 may be of any suitable character, as it may be a transfer surface, or it may be a planographic surface, or it may be an offset material, and, as hereinbefore pointed out, the said surface may constitute either the elastic or inelastic layer. A device of this nature could be used for the purpose of receiving a line of impressions from a suitable composing machine upon its surface, and where the said surface is of an offset nature the matter carried upon the bar, after being automatically justified, could be then impressed in its justified condition upon a planographic bar, which could then be prepared for printing. The use of this device set forth above is illustrative merely and not restrictive. The various steps in connection with the use of the said bar might also be carried out by a machine designed for the said purpose.

The invention, in its broader aspects, is not limited to the particular constructions shown, nor to any particular constructions by which it has been or may be carried into effect, as many changes may be made in the construction without departing from the main principles of the invention and without sacrificing its chief advantages.

What I do claim as my invention and desire to secure by Letters Patent, is:

1. The combination with a surface bearing a line of characters and comprising a continuous layer of elastic material, and a layer of inelastic material, said inelastic layer being severed between the various groups of characters, of means for automatically changing the length of the said elastic layer to bring the line of printed characters to a predetermined measure.

2. The combination with a surface bearing a line of characters and comprising a continuous layer of elastic material and a layer of inelastic material which is discontinuous between the various groups of characters, of means for changing the tension of the said elastic layer so as to bring the line of characters to a predetermined measure and then hold the line at the said predetermined measure.

3. The combination with a surface bearing a line of printed characters and comprising a continuous layer of elastic material and a layer of inelastic material which is discontinuous between the groups of characters, of means for holding the said elastic layer under tension, means for increasing or decreasing the tension of the said elastic layer so as to bring the line of characters to a predetermined measure and means for main-

taining the tension of said elastic layer so as to keep the line of characters at the said predetermined measure.

4. The combination with a surface bearing
5 a line of characters and comprising a continuous elastic layer and a discontinuous inelastic layer, of means for holding said elastic layer under tension, means for increasing or decreasing the tension of the said
10 elastic layer so as to bring the line of characters to a predetermined measure, and means operating upon said tension-changing means to maintain the said line of characters at the said predetermined measure.

15 5. The combination with a surface bearing a line of characters and comprising a continuous layer of elastic material and a layer of inelastic material discontinuous between the groups of characters, of means for holding the said elastic layer under tension,
20 means for releasing the said holding means and for increasing or decreasing the tension of said elastic layer so as to bring the line of characters to a predetermined measure, and means for holding the said line of characters
25 at such predetermined measure.

6. The combination with a surface bearing a line of characters and comprising a continuous elastic layer, an inelastic layer discontinuous between the groups of characters,
30 means for holding said elastic layer under tension, means for releasing the said holding means and for increasing or decreasing the tension of the elastic layer so as to bring the line of characters to a predetermined
35 measure, and means operating upon the said tension-changing means to hold the line of characters to the said predetermined measure.

7. The combination with a surface bearing
40 a line of characters and comprising a continuous elastic layer and an inelastic layer discontinuous between the groups of characters, means for holding the said elastic layer under tension, locating means attached to the
45 said surface in a definite relation to the end character of the line, means for throwing off the holding means and for coacting with the said locating means to bring the line of characters to a predetermined measure.

50 8. The combination with a surface bearing a line of characters and comprising a continuous elastic layer and an inelastic layer discontinuous between the groups of characters, means for holding the said elastic layer
55 under tension, locating means attached to the said surface in a definite relation to the end character of the line, means for throwing off the holding means and for coacting with the said locating means to bring the
60 line of characters to a predetermined measure, and means for holding the said surface so as to keep the line of characters at the predetermined measure.

9. The combination with a surface bearing
65 a line of characters and comprising a con-

tinuous elastic layer and an inelastic layer discontinuous between the groups of characters, of a clamp for holding the said elastic layer under tension, locating means attached to the said surface in definite relation to the
70 end character of the line, means for throwing off the said clamping means and coacting with the said locating means to vary the tension of the said elastic layer to bring the line of characters to a predetermined measure
75 and means carried by the locating means to hold the locating means and the tension-changing means in such relation as to keep the line of characters to the predetermined measure.

10. The combination with a surface bearing a line of characters and comprising a continuous layer of elastic material and a layer of inelastic material discontinuous between the groups of characters, of a clamp
80 for holding the elastic layer under tension, a locating member attached to the surface in a definite relation to the end character of the line and having a cam face, means for throwing off the said clamp and coacting
85 with the said cam face to change the tension of the surface to bring the line of characters to a predetermined measure, and means for holding the said last-mentioned means in a definite relation to the said lo-
90 cating means in order to keep the line of characters at the predetermined measure.

11. The combination with a surface bearing a line of characters and comprising a continuous elastic layer and an inelastic
100 layer discontinuous between the groups of characters, of locating means attached to the said surface in a definite relation to the end character of the line and means coacting with the said locating means to bring
105 the line of characters to a predetermined measure by varying the length of the said elastic layer.

12. The combination with a surface bearing a line of characters and comprising a
110 continuous elastic layer and an inelastic layer discontinuous between the groups of characters, of locating means attached to the said surface in a definite relation to the end character of the line, means coacting with
115 the said locating means to bring the line of characters to a predetermined measure by varying the length of the said elastic layer, and means for holding the said locating means and its coacting means so as to keep
120 the line to the predetermined measure.

13. The combination with a surface bearing a line of characters and comprising a continuous elastic layer and an inelastic
125 layer discontinuous between the groups of characters, of locating means carrying a cam face, means coacting with said cam face to bring the line of characters to a predetermined measure by varying the length of the said elastic layer and means for holding
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said cam face and its actuating means in a fixed relation so as to keep the line of characters to the predetermined measure.

14. A composing device, including in combination a surface for receiving a line of inked characters and means for then justifying the line of characters by varying only the interverbal spaces.

15. A composing device including in combination a surface for receiving and holding a plurality of inked characters in line conformation, and means for changing said surface at the interverbal spaces only to justify the line.

16. A composing device including in combination a surface for receiving the impression of a line of characters, and means for

then justifying the line of characters by increasing or decreasing only the interverbal spaces in said line of characters.

17. A composing device including in combination a surface for receiving an inked imprint of an unjustified line of characters, and means for then justifying the line of characters by increasing or decreasing only the interverbal spaces in said line of characters.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE R. CORNWALL.

Witnesses:

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