

Jan. 30, 1951

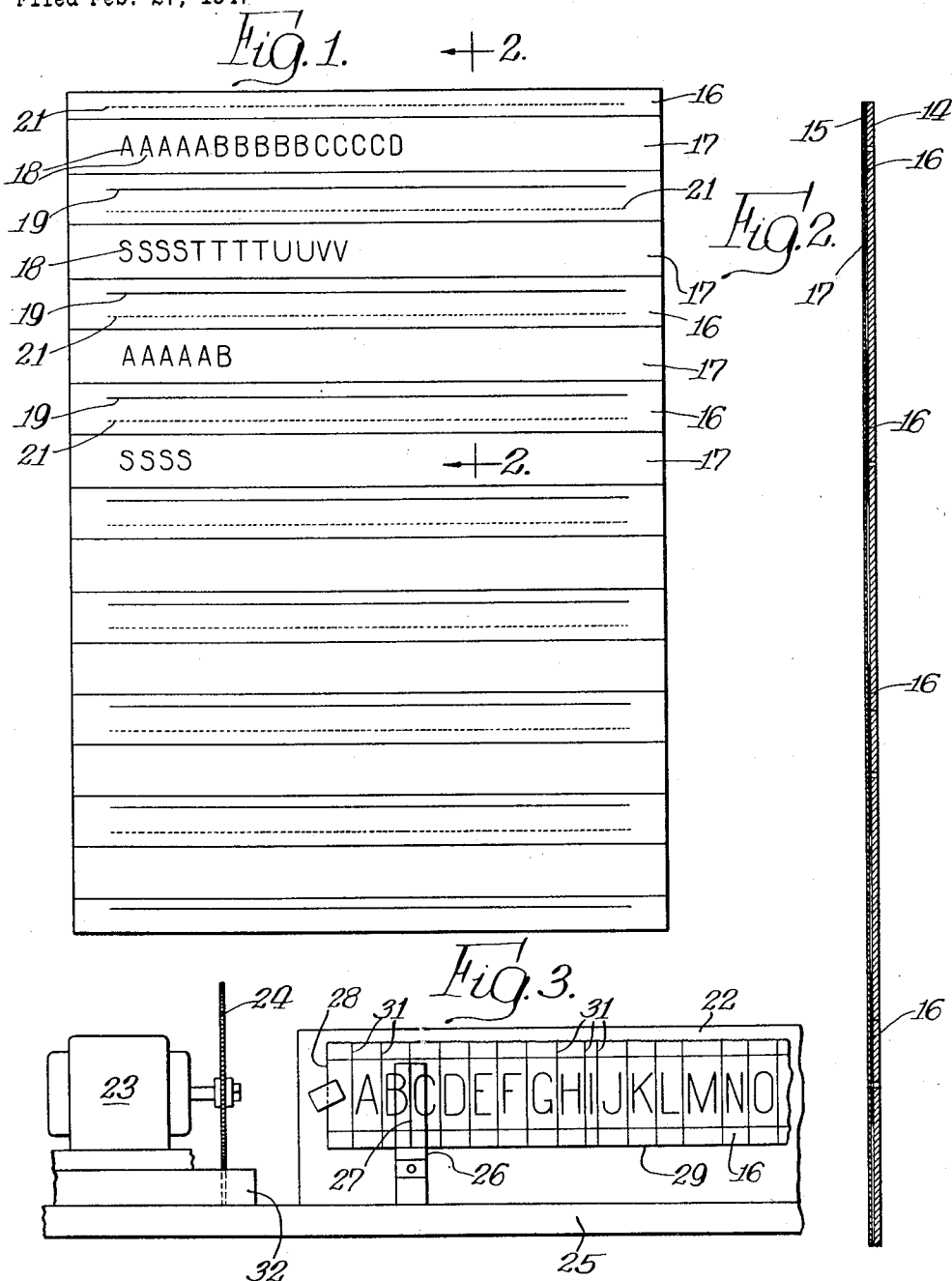
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2,539,609

METHOD OF COMPOSING TYPE LINES FOR REPRODUCTION

Filed Feb. 27, 1947.

3 Sheets-Sheet 1



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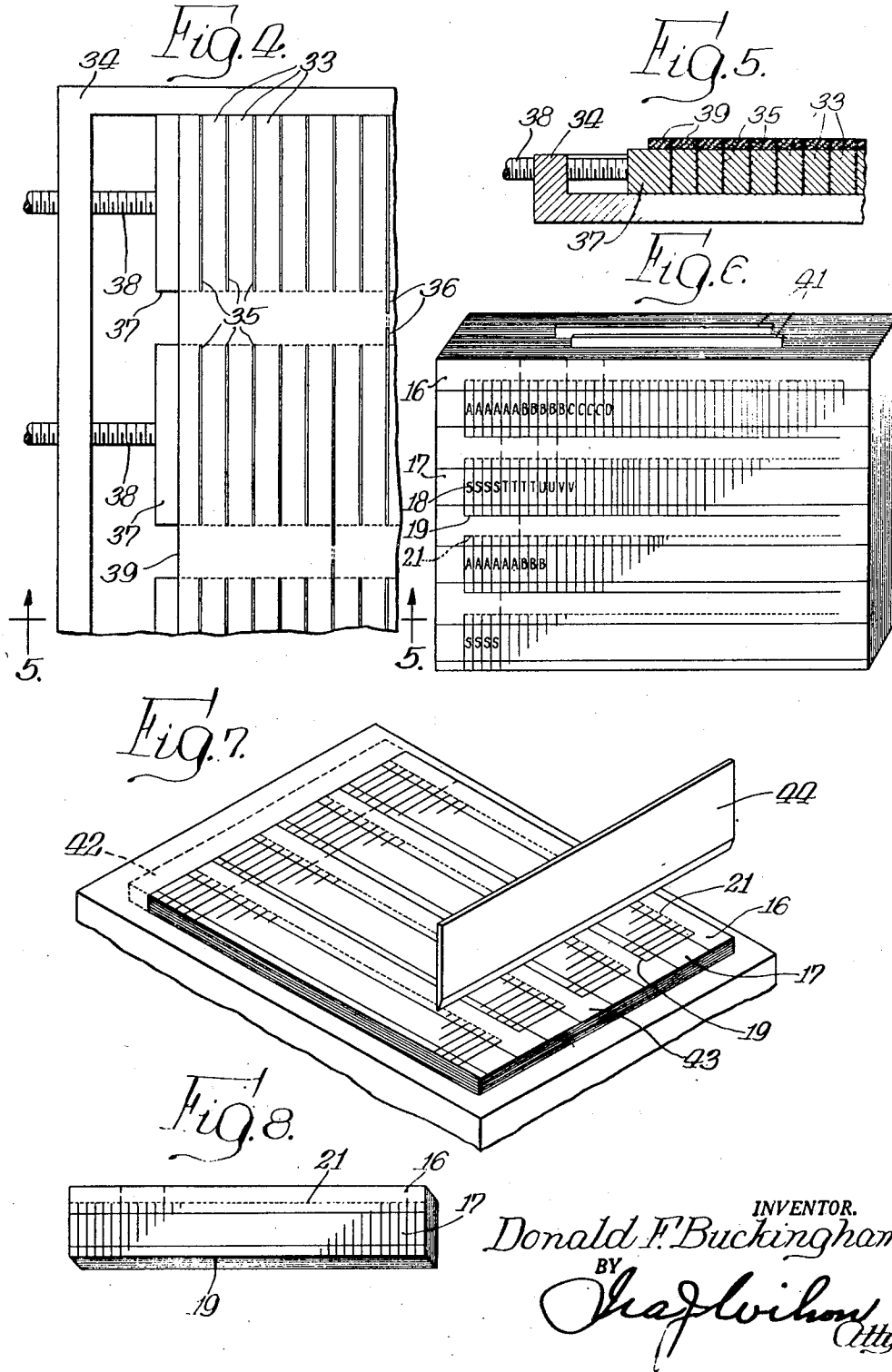
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METHOD OF COMPOSING TYPE LINES FOR REPRODUCTION

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3 Sheets-Sheet 2



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METHOD OF COMPOSING TYPE LINES FOR REPRODUCTION

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3 Sheets-Sheet 3

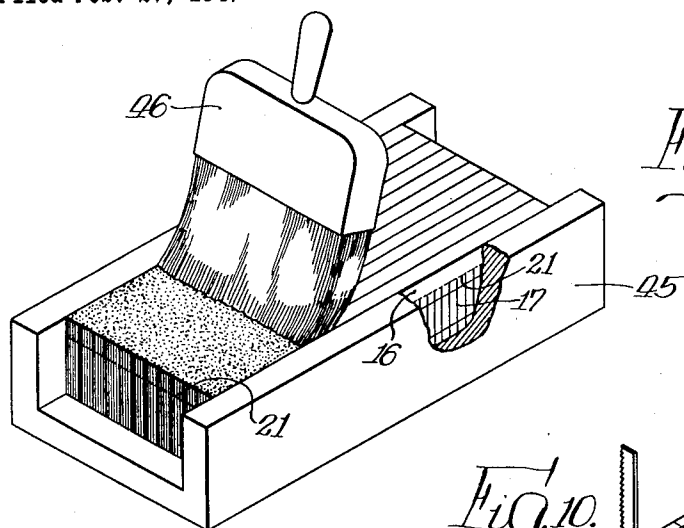


Fig. 9.

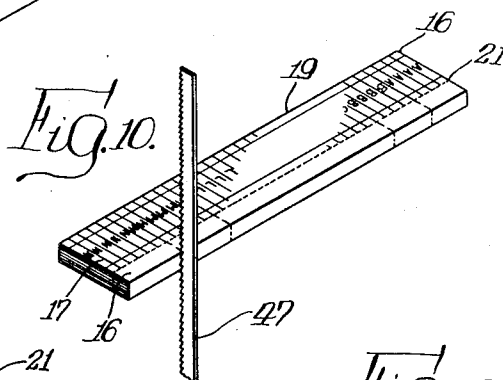


Fig. 10.

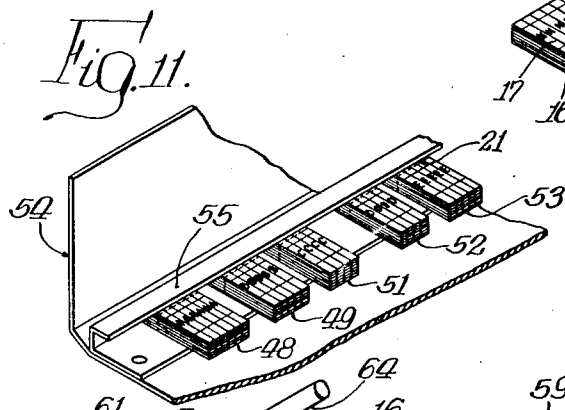


Fig. 11.



Fig. 13.

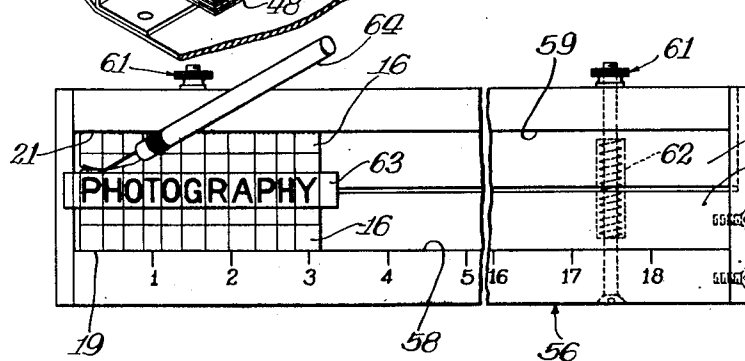


Fig. 12.

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2,539,609

METHOD OF COMPOSING TYPE LINES FOR REPRODUCTION

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Application February 27, 1947, Serial No. 731,204

2 Claims. (Cl. 154—121)

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The invention herein revealed lies in the graphic arts and while in its variations and modifications may be adaptable to other arts and to the sciences for particular uses, its primary relationship is to the arts of printing, photography and other graphic reproductions of visual material. In one sense this invention may be considered to be an improvement upon that disclosed and claimed in my copending application, Serial Number 582,089, filed March 10, 1945, but in other aspects it is of a nature independent of and apart from the earlier invention. Involved in this invention are a product of manufacture prepared as an article for sale as such and to be used in reproduction processes or in preparing work for reproduction, a method preferred for preparation of such article, and an article produced by certain manipulations or preparations for use of the originally prepared product. All of these elements of the invention will become apparent from the disclosure hereof which will be made with reference to the use of the invention in the advertising and photographic fields.

In the preparation of advertising copy it is frequently necessary to prepare what are commonly known as "lay-outs" which, for instance, may consist of pictorial representations of objects for which word or figure titles, headings, sub-headings or other written legends, etc., may be required. In many cases such words and figures are applied by hand and the character and style thereof are at the mercy of the lettering artist or draftsman doing the work which, of course, is tedious and time consuming. In other cases the legends and other lettering and the like has been done by hand composition of type with photographic proofs, another slow and expensive process. Where the layout was prepared with the aid of typewriter typing although a different type was required for the final work, it became necessary to visualize in the "mind's eye" what the final appearance would be and to instruct the printer as to the character, style and size of type to be used, and to check proofs to assure the desired result. With the invention, the layout composer or artist may choose and prepare his work with the precise style, size and other characteristics of type desired for the work composition so that the final result will truly represent the intended creation.

Where photograph negatives or positives are to be copied or reproduced by any process and it is necessary or desirable to apply any legend, such as a heading, title, identification name or number, thereto, either for temporary or perma-

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nent attachment to the film or photograph to be copied, use of the invention will make unnecessary hand lettering and other tedious and expensive, as well as undesirable, processing for the purpose.

These and many other ends are served through the provision of individual type, character or object units affixed to or carried on a suitable medium, in turn supported or carried by stiff paper such as cardboard or paper-board backings, the ensemble forming a composite unit or tablet adapted to be compiled or bound in plural numbers in pads or the like from which the individual units or tablets may be torn or pulled off for use as and when desired. The construction and arrangement are such that, for instance, in using a set of bound tablets carrying alphabetical characters to form words, the user will tear off the correct letter tablet units as needed and, after arranging them in proper order and alignment, will secure them in their arranged position by applying a strip of adhesive tape or the like to and across all of the tablets so arranged and composed and then transfer the characters so secured bodily from the tablets to a place of use. Absolute alignment of all characters is attained.

In my prior application somewhat similar tablets composed of heavy paper, paperboard and similar relatively stiff material are directly printed with the same character on both obverse and reverse sides with the character on one side upside down with respect to the character on the other and are bound in books, composed and taped in composed array with the character on the reverse side uppermost. After taping, the composed word or series of characters are overturned to expose the characters on the obverse side and applied as a unit wherever desired for photographing or other reproductive process. Ordinarily the character on the obverse side only will be used for the reproduction work and in such case the same character on the reverse side need only be printed or marked as a signal or indicator to the user as to what character is on the obverse side.

The invention hereof differs in a number of important respects from that of my prior application and materially increases the fields of useful applications and uses of such devices besides affording greater simplicity. Instead of printing or otherwise affixing characters on both sides of the tablet, the characters for reproduction are printed or otherwise affixed to a thin film or cover sheet of transparent, translucent or even

relatively opaque material secured on a tablet backing in such manner that the film itself may be removed together with its character marking from the tablet as by the application of pressure-sensitive tape to the face of the film and release, as by cutting, of the film or cover sheet from the tablet backing member.

The present invention also differs from the former in the method of effecting composition of words, signs, etc., and in the constructional features facilitating such process. In the prior process the composition of a word was effected with the photographically reproducible characters laid and aligned in an upside down condition, that is, with the reverse side up and the obverse side down or away from the observer, and the aligning edge of each tablet is disposed at the base of the characters on the reverse side or at the top of the characters on the obverse side, whereas, in the instant invention the composition is effected with the characters for reproduction disposed in normal position facing to the observer and with the aligning edges of the tablets at the bases of such characters, the "book attaching" edges, i. e., the scored edges, being disposed at the tops of the tablets.

As above hinted, the present invention contemplates the application of the reproducible characters to a transparent or translucent cover sheet or film on the tablet and the transfer of such cover sheet or that portion thereof which carries the character, to and its fixation to an object or place where the character or group of characters will be used, by means of a tape or the like bearing a pressure-sensitive adhesive on one side. If, as experience has proven, the pressure-sensitive tape and the cover sheet or film are transparent, the tape may be placed directly over the entire body or a part of the body of the character on the cover sheet or film for transfer to and affixation upon an object such as a photograph or film for reproduction by transmitted or reflected light. The same is true when the tape and film are translucent but not transparent or either is translucent but not transparent and the other is transparent, that is, both transmitted and reflected light may be used for reproduction. Even cover sheet or film and transfer and securing tape opaque to ordinary transmitted light may be used with characters opaque to X-rays for such purposes as marking or identifying X-ray pictures.

The invention hereof has many other objectives and purposes and differs from the invention of said prior application in a number of other respects, all of which will be or should become apparent to those skilled in the arts to which the invention relates after reading the following description of a presently preferred embodiment and the appended claims and after viewing the drawings in which:

Fig. 1 is a face or front view in plane of a laminated sheet comprising a backing sheet of relatively stiff material such as cardboard or paper board and a cover sheet of relatively thin transparent material such as cellulose acetate upon which characters, in this instance English alphabet letters, have been printed;

Fig. 2 is a fragmentary sectional view taken along the section line 2—2 of Fig. 1 but drawn on a greatly enlarged scale;

Fig. 3 is a schematic view of one type of apparatus for producing spacing blocks conforming in width to the width of the letters appearing on the laminated sheet shown in Figs. 1 and 2;

Fig. 4 is a view of a part of a set-up of a cut-

ting die comprising a plurality of rows of spacing blocks, knives and die pad assembled together;

Fig. 5 is a view in section of the die assembly of Fig. 4, taken along the section line 5—5 of Fig. 4;

Fig. 6 is an isometric view on a reduced scale of a number of superposed stacks or packs of composite sheets after they have been slitted between individual letters or characters by the knives of the die block of Figs. 4 and 5;

Fig. 7 illustrates a method by which the stacks or packs of sheets are trimmed to remove the sheet side margins;

Fig. 8 is an isometric view of a strip or block of connected letter tablets resulting from the die and trimming operations;

Fig. 9 is an isometric view illustrating one method by which the blocks of letter tablets may be "booked" or made into pads by applying adhesive or other backing and securing material to the binding edges;

Fig. 10 is an isometric view diagrammatically illustrating the operation of cutting a strip or block of booked tablets into sections of similar character tablets or unit items;

Fig. 11 is an isometric view of a fragment of a kit with sections of booked tablets disposed therein and clamped by their bound edges, ready for use;

Fig. 12 is a plan view of a composing device or "stick" with a plurality of individual tablet items or units set up or composed therein ready for photography in place or for removal to some other location for such purpose; and

Fig. 13 illustrates the set of characters shown in Fig. 12 after they have been removed from the composing stick shown in Fig. 12, and as they appear with a tape securing them in the composition arrangement and ready to be applied to an object for photographic or other reproduction.

In practicing the invention in one of its preferred particular embodiments, a sheet of relatively stiff material such as card-board, paper-board or thick paper 14 which may be wholly opaque, is covered with a sheet 15 of relatively thin transparent material such, for instance, as cellulose acetate. Prior to application of the cover sheet 15 to the backing sheet 14, an adhesive material, preferably a cellulose acetate solution or a thermoplastic, is applied to that face of either sheet which is to lie against and be secured to an adjacent face of the other sheet, the adhesive being applied across the entire sheet width in parallel spaced paths, bands or strips 16 of sufficient width to permit certain operations to be performed entirely within the bounds of such adhesive paths as will later appear. It will be understood, of course, that other adhesives which will effect firm and relatively permanent security between the sheets may be used whether such adhesives are opaque or transparent, and that the adhesive paths or bands need not be wholly continuous but may be interrupted if such interruption does not adversely affect other and later operations. The spacing between paths or bands 16 is such as to leave unsecured areas or bands 17 extending entirely across the composite or laminated sheet upon which rows of similar or different characters 18 may be printed or otherwise affixed to the cover sheet 15.

The characters 18 are printed after the cover and backing sheets have been secured together in which case the characters will be applied on the outer face of the cover sheet. In securing the sheets together care should be exercised to avoid creeping or wrinkling or drawing of the

cover and backing sheets so that the resultant composite sheet has a smooth and even surface. Care should be taken also to maintain fair accuracy in the spacing between paths of adhesive to insure room for placement of characters 18 wholly within unsecured areas and with a reasonable space between the tops and bottoms of the characters and the margins of adjacent paths of adhesive, all for reasons which will appear.

The characters 18 are represented in this instance as capital English letters but they may be in any form of type, either letters or numerals, and may be pictorial representations of any design. Furthermore such characters need not be printed for they may be hand drawn or applied as stencil or other cut-outs by the use of an adhesive or otherwise. However, to facilitate production and use it will be usual to apply the characters directly upon the surface of the cover sheet by printing processes and to print multiples of the same character in succession as illustrated in Fig. 1. Characters printed with an ink containing dispersed materials relatively opaque to X-rays may be used when the ultimate purpose is to provide identification numbers, letters and the like for X-ray work. It will be found desirable and many times necessary as for work such as that illustrated, to print all letters or figures and so forth in a row or on one job, in such manner that their bases are disposed at a predetermined or fixed distance from a datum or reference line which in this embodiment will be an alignment edge formed by a slit line 19 which may be cut by a knife in the printing press bed under the pressure of the platen if a platen type press is used in the printing. Such procedure will produce a sheet with the bases of the characters of each row on a common base line extending parallel to and at a precisely uniform distance from a slit line 19 therebelow. The purpose of such precision spacing will appear as this description proceeds.

Spaced from the tops of the characters of each row and also formed during the printing operation, if desired, as in the case of slit lines 19, is a score or tear line 21, which may consist of a closely spaced series of small perforations, for a purpose to be described. The score or tear lines 21 do not have to be at any precise distance above the characters 18 but they and the slit lines 19 are desirably placed within the longitudinal edge bounds of the paths or bands of adhesive 16. Preferably the score lines 21 will be parallel to the base line of the characters and the slit lines 19 although such arrangement is not absolutely requisite. The final sheet product, therefore, will consist of the laminated backing and cover sheets with a plurality of rows of printed characters (eight rows in Fig. 1) disposed on areas of the cover sheet which are unsecured to or free from the backing sheet, with a corresponding number each of score lines and slits located within and through the secured or adherent areas 16 and at the top and bottom, respectively, of each character row.

When a desired number of sheets have been prepared as above described the next step may be the separation of each character from adjoining characters of its row. Although the characters may be printed in such manner as to space them equal distances from one another in the same row or line, the distances from center to center of different characters may vary considerably. For instance, the letters "W" and "M" are

of greater width than the letter "I." It becomes necessary, therefore, in order to maintain uniform spacing between different letters in effecting word compositions, equally to divide the spaces between adjacent letters, such spaces being equal as stated. In effecting this separation the sheets are placed in a platen press, a number of similarly printed or duplicate sheets at a time in superposed registration, and fed one at a time to a set of knives which have been spaced to effect the cutting along lines bisecting the spaces between adjacent letters regardless of the width of such spaces. This cutting may be accomplished through the use of a die including knives and spacing blocks of the character illustrated in Figs. 4 and 5, the blocks themselves being cut, by an apparatus such as that shown in Fig. 3, to provide correct spacing. Preferably alternate rows are cut by one die and the sheets are re-run to cut the other rows uncut by the first die.

Referring first to Fig. 3, a holder 22 is stationarily mounted upon a bed or base (not shown) upon which a motor 23 is also relatively fixedly mounted with a small rotary disc saw 24 on the motor shaft. A table 25 is mounted for reciprocation in a path parallel to the motor shaft or at right angles to the plane of the saw blade, and carries any suitable guiding or holding mechanism (not shown) for a strip or board of wood from which the spacing blocks are to be made. The guides or holding mechanism should be arranged to permit the wood strip or board to be run into and past the saw or the table 25 may be mounted for movements in a direction parallel to the plane of the saw blade for the purpose of cutting off the spacing blocks. A sighting device comprising an upstanding member 26 made of transparent plastic or other suitable material, and having an indicating or sighting line 27 thereon, is secured to the table 25 for movement therewith in directions parallel to the axis of the motor shaft and for movements relative thereto when the table is moved transversely of the motor axis. The construction and arrangement of this spacing block cut off mechanism forms no part of the invention and is merely illustrated for convenience of understanding the process of the invention.

A strip of characters is separated from one of the printed sheets and secured against the face of holder 22, as indicated by reference number 28 in Fig. 3, with the base or aligning edge 29 parallel to the plane of the table top or the dividing or parting lines 31 between characters disposed parallel to the indicating or sighting line 27. If now the table is moved to a position where the sighting line 27 is exactly over the predetermined position where the first parting line 31 to the left of the letter "A" of strip 28 is to be, and the table or wood board is moved transversely, with a suitable board 32 in place as shown, the board end will be cut off. This initial cut off piece of board may be discarded. Next the table is moved longitudinally until the sighting line 27 is exactly over the position of the succeeding parting line 31 (to the right of the letter "A") whereupon the table or board is again moved transversely to cut off a spacing block which will be of a width equal to the distance from one parting line 31 to the other on opposite sides of the letter "A" less the thickness of the saw blade which, for convenience, may be equal to the thickness of a die knife to be described. Continuing this process will produce a series of

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spacing blocks corresponding in widths to the respective letter widths.

After a complete or desired series of spacing blocks have been formed, the blocks are assembled, as indicated at 33 in Figs. 4 and 5, in a die frame 34 with knives 35 and 36 disposed between them, and held firmly together in the frame by means of suitable clamps operated by screws 38 carried by the frame. The knives 35 and 36 will be spaced as determined by the spacing blocks and their own thickness and, of course, corresponding to the spacing of the respective letters or other characters of the sheet rows 18. The same or a similar procedure is followed for cutting apart the characters of each row of the sheet so that with the one cutting die, when all blocks and knives are in place, all characters on an entire sheet may be cut at once. The shorter knives 35 are used to separate similar characters from one another as an "A" from adjacent "A's," while the longer knives are used to separate different characters from one another and to mark divisions therebetween as a guide to an operator who is separating blocks of similar characters from adjacent blocks using a dividing saw or other cutting means. It will be noted from Figs. 6, 7, 8 and 10, that the shorter knives 35 are of a length to cut from the score lines 21 to the slit lines 19 whereas the longer knives 36 cut beyond both the slit lines and score lines.

In order to support the sheets and particularly the portions between knives 35 and 36 during the separating operation and to aid in releasing all parts of the sheet from the cutting die after operation thereof, a sponge rubber blanket 39 is disposed over the entire face of the die or at least over an area thereof corresponding to the area of a sheet. Normally this blanket will be of a thickness just slightly greater than the elevation of the cutting edges of knives 35 and 36 above the top surfaces of the die blocks 33 but under pressure of the platen the rubber will be compressed as the sheet is cut.

Sheets so prepared may then be stacked after the manner shown in Fig. 6, duplicate sheets of one set or type and arrangement of characters being segregated from other sets or types by dividers or markers 41. Thereafter the stacked sheets are placed in a shear (schematically illustrated in Fig. 7) for removal of their margins 42, 43 by means of a shearing knife such as that designated 44, thereby effecting separation of each row of characters from other rows so that the resultant products appear as indicated by Fig. 8. The next succeeding step is to combine groups of duplicate rows of characters in over-riding register and corresponding order in pads of any desired number as, for instance, five to twenty-five, with or without a spacing sheet of paper between adjacent groups and set them in a jig or the like 45 (see Fig. 9) with the marginal edges adjacent to the score lines 21 disposed in exposed position. These exposed upper edges are then coated with a flexible cement after the usual method of padding or booking sheets, the brush 46 of Fig. 9 symbolizing this operation.

Upon the setting or drying of the cement or other booking adhesive, the pads are divided into sections, for convenience each section bearing only one type of character. The division into sections is performed by a band saw symbolically indicated at 47 in Fig. 10, or by any other suitable means, the long kerfs extending through the score lines serving both as a guide indicator and to facilitate the entry of the saw blade at the proper

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place. By this operation the pads are divided into as many different sections as there are different characters per row, the divided sections of a row appearing then as shown in Fig. 11 and designated 48, 49, 51, 52 and 53. Fig. 11 depicts a holder for the booked sections each of which now consists of a plurality of tablets or individual items each bearing a similar character and each booked section carrying a set of similar characters set apart from the adjacent sets of different characters. The holder, designated generally by reference number 54, may be of any suitable type but preferably carries a U-section spring clip member 55 adapted to clamp a suitable number of pads or sections each in turn comprising a plurality of tablets or unit items in adjacent stacks. As illustrated in Fig. 11, all tablets in section 48 bear the letter "A," all those in section 49 bear the letter "B" and so on. Set up in a holder of the character shown and separately therefrom for replacement purposes, the booked tablets are sold to the consumer for use.

There are many uses for the product thus provided, one of the chief uses being for photographic reproduction lay-outs. Assuming that a user is desirous of composing a word for application to any object for photographic reproduction thereof, the word will be prepared or composed by tearing off (along the score lines 21) tablets bearing the appropriate letters. By employing what may be termed a "composing stick" or holder, shown in Fig. 12 and generally designated 56, having a centrally disposed and longitudinally extending groove or depression 57 of slight depth which may be somewhat greater than the thickness of a tablet, the lettered tablets are laid side by side in the desired order in the groove or depression. The tablets will be placed in the groove with their aligning edges defined by the slits 19, abutted against the lower edge or shoulder 58 of the groove and their upper edges defined by the score line 21, abutted against the upper edge or shoulder 59 of the groove. Preferably, the "composing stick" is made in two parts adapted to slide, one on the other, toward and from one another to widen or narrow the groove to fit different tablet lengths (only one length being used in a set), and for the purpose of firmly but lightly pressing the shoulders 58 and 59 toward one another and firmly against the respective edges of the tablets to align the letters, the device may be provided with thumb-screw type tensioning means generally designated 61 in which mechanism there are light springs 62 (one only shown) normally urging the two parts of the "composing stick" apart.

The tablets bearing the desired characters being arranged and aligned in proper order and position in the "composing stick" and with the characters facing upward and upright with respect to the observer, the screw clamps 61 are operated to hold the tablets firmly as so positioned with their aligning edges 19 against the straight edge 58. The next procedure is to apply a strip of adhesive bearing tape 63 completely across all of the composed tablets, applying the adhesive bearing face of the tape against the upper face of the character bearing cover sheet of all the tablets, preferably wholly within the unsecured areas 17 of such cover sheets. The tape used for the illustrated embodiment is a transparent cellulose acetate strip bearing a non-drying pressure-sensitive adhesive on one face. Tape of this type is well known on the market. The ends of the tape may extend beyond each

end of the composition (word) so as to leave adhesive tabs by which the composition may be applied and secured to an objective. The next step after applying the tape 63 is to cut the cover sheet 15 loose from the backing sheet 14 of each tablet as by drawing a sharp knife 64 longitudinally of the composition on each side of the tape 63 and parallel to its edges, effecting the cuts within the area 17 of the cover sheet. When the tape 63 is lifted from the "composing stick" it carries with it the characters of the word or other composition and appears as illustrated in Fig. 13.

It is not necessary, of course, that the tape 63 be of a width to cover the characters or that it be applied over the characters or any part of them, although such procedure is at once simple and effective, for narrow strips of tape may be used for application lengthwise of the composition above and below the composed word and may even extend onto the secured paths 16. In the latter case some portion of the tape must remain attached to each of the character holding portions of the cover sheet when the composition is cut loose from the backing sheets, as will be understood.

Since contrasts or differences in light transmission or absorption are fundamentals in photography and related processes, the principles of the invention may be used and applied in many different ways. As indicated above, both the cover sheet of the tablet and the tape used therewith could be opaque to ordinary light rays if the characters to be reproduced are to be reproduced by exposure to X-rays and the material of which the characters are formed or outlined is relatively opaque to X-rays. Various combinations of cover sheet material and tape, insofar as light transmitting, absorbing and reflecting characteristics are concerned, may be used to obtain interesting and valuable effects. The process and products may be utilized to compose words in a curved line, for curves of predetermined radii, in which case the base or alignment edges 19 would be cut to the desired curvature and the composition would be effected against a similarly curved edge in a "composing stick" or the like; in such instances the side edges of the panels would be shaped accordingly as will be understood.

The invention has many advantages including speed and economy of production, accuracy of composition and attractiveness and effectiveness of final product, all of which will be apparent from the foregoing description. Variations and adaptations of numerous kinds may also be developed by those skilled in the art as will also be realized. Consequently, I desire to be limited only by the invention spirit and the scope of the appended claims.

I claim:

1. The method of composing type lines for reproduction, which comprises securing a sheet of light transmitting material to a sheet of opaque

material by spaced apart strips of adhesive leaving a non-secured area between said strips, applying photographically reproducible characters in straight lines to the faces of said non-secured areas, simultaneously slitting the composite sheet a predetermined distance from each line of characters thereon and parallel with such line of characters to form strips each having an aligning edge disposed a predetermined distance from the line of characters thereon, dividing said strips into individual character units, separating selected ones of said units from the remainder, arranging said selected units in succession with said aligning edges thereof disposed in alignment, binding said aligned units together with a strip of transparent adhesive material, and cutting said units adjacent each edge of said adhesive strip and within said non-secured areas to produce a strip of aligned characters for reproduction.

2. The steps in the method of composing type lines for reproduction by a process such as photography which comprise, covering a sheet of opaque and relatively stiff material such as paper board with a light transmitting sheet of material, securing said sheets together by an adhesive along predetermined paths spaced from one another, said sheets being left unsecured between said paths, applying, as by printing, reproducible characters on said light transmitting sheet in a row in the space between paths of adhesive, slitting the composite sheet a predetermined distance from each line of characters thereon to form strips each carrying a line of characters and each having an aligning edge produced by said slitting and disposed a predetermined distance from the line of characters thereon, dividing said strips into individual character units, arranging selected ones of said units with their aligning edges abutting a straight edge to dispose the characters of the arranged units in alignment, binding said aligned units together with a strip of transparent adhesive material, and cutting said units adjacent each edge of said adhesive strip and within said non-secured areas to produce a strip of aligned characters for reproduction.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,875,410	Babcock	Sept. 6, 1932
1,937,858	Taber	Dec. 5, 1933
2,166,819	Miller	July 18, 1939
2,200,203	Heintz	May 7, 1940
2,250,583	Krauter	July 29, 1941
2,372,994	Welch	Apr. 3, 1945
2,391,539	Avery	Dec. 25, 1945