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C. H. VAN DUSEN, JR

2,268,679

PRINTING DEVICE

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FIG. 1.

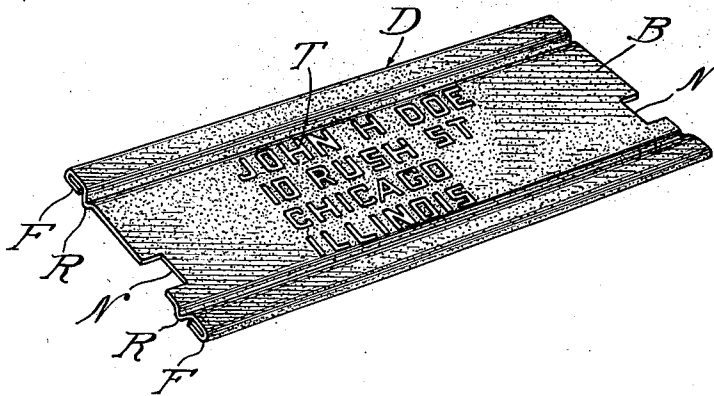


FIG. 2.

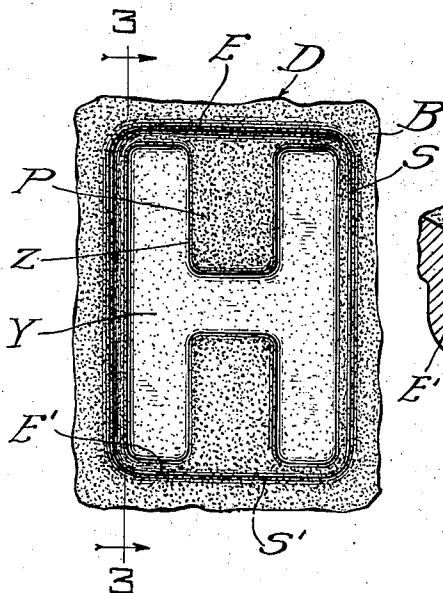
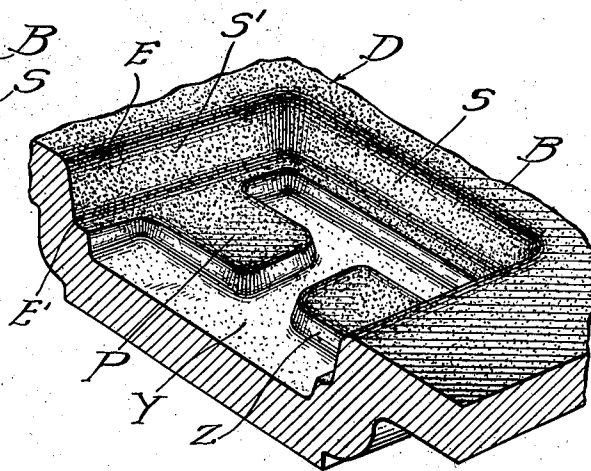


FIG. 3.



Inventor:
Charles H. Van Dusen, Jr.
By Wallace & Cannon
Attorneys:

UNITED STATES PATENT OFFICE

2,268,679

PRINTING DEVICE

Charles H. Van Dusen, Jr., Willoughby, Ohio, assignor to Addressograph-Multigraph Corporation, Wilmington, Del., a corporation of Delaware

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6 Claims. (Cl. 101—369)

This invention relates to printing devices of, for example, the kind that are passed seriatim through addressing and like printing machines and which are customarily stored in suitable drawers or the like when not in use.

In its primary aspects, this invention pertains to what are known in the art as one-piece printing devices in contradistinction to printing devices that embody a frame on which an embossed metal plate is detachably retained and on which frame there is also what is called an index card bearing an impression made from at least selected of the embossed type characters on the plate whereby the index card facilitates ascertainment, in filing and other handling of the printing devices, of what may be printed from the type characters. The printing devices disclosed in Duncan Patent No. 1,026,247, patented May 14, 1912, and in Tomlinson Patent No. 1,151,501, patented August 24, 1915, are representative of the kind of printing devices to which the present invention primarily pertains, which is to say, printing devices which do not embody an index card of the aforesaid character wherefore, in order to ascertain what may be printed from the embossed type characters, it is necessary to read the type characters.

The type characters are customarily embossed on a printing device to appear in relief on one face and in intaglio on the opposite face. The outermost faces of the portions of the embossed type characters that appear in relief afford the printing surfaces of the characters that are inked in a suitable manner, as by an ink ribbon, in impression operations wherefore, in order to read the embossed type characters in an ordinary manner, reference is made to the face of the printing device where such type characters appear in intaglio, this being known as the intaglio face of the printing device.

One-piece printing devices of the aforesaid character have heretofore been produced from rolled metallic strips and as a result light-reflective surfaces are found on opposite faces of the printing devices. Such surfaces have somewhat impaired reading the type characters embossed on the device for in addition to the light-reflective faces a plurality of rounded or more or less angularly related surfaces were produced in the embossing operation, which also tended to burnish the metal and increase the light-reflective properties thereof. Hence, with the light-reflective properties of the adjacent face of the device and the light-reflective surfaces of the embossed characters it was somewhat difficult to distin-

guish one type character from another when attempting to read the same.

In order to facilitate reading of the intaglio faces of type characters embossed on one-piece printing plates it has heretofore been proposed to fill these faces with paint or other material to thereby contrast the type characters from the adjacent surface of the printing device. This, however, is subject to objections since filling the intaglio faces of the type characters is relatively expensive and in view of the service to which printing devices of this character are put, in which they are frequently subjected to shocks, pressure and the like, it is somewhat difficult to retain paint or the like in the intaglio faces of the embossed type characters.

Thus while the difficulty of reading the intaglio faces of type characters embossed on one-piece printing devices has heretofore been recognized, there has been no satisfactory solution of the problems entailed in facilitating the reading of such type characters, and therefore the primary object of the present invention is to overcome the difficulties heretofore encountered in the reading of type characters embossed on so-called one-piece printing devices and the like.

One of the difficulties that has been encountered heretofore in reading embossed type characters has been the glare attendant to light falling on the smooth and somewhat glaring face of the printing device when it was attempted to read the embossed type characters, and thus another object of the present invention is to afford a non-glaring surface on a printing device and thereby facilitate reading of type characters embossed thereon.

Furthermore, another difficulty that has been encountered in endeavoring to read type characters embossed on printing devices has arisen by reason of the fact that there was no contrast between such an embossed type character and the adjacent surface of the printing device, and thus another object of this invention is to enable a contrast to be established between an embossed type character and the adjacent surface of the printing device on which it is embossed and thereby expedite reading of the embossed type character.

Other and more specific objects are to afford at least one dull surface on a printing device or the like and thereby render such surface non-glaring; to so treat at least one surface of a printing or like device that when a type character is embossed on the device a contrast will be afforded between such character and the ad-

jacent surface of the device; and to afford a dull surface on at least one face of a printing or like device so that in the course of embossing a type character on the device the portion so embossed will be somewhat burnished to thereby afford a contrast with the dull surface, whereby reading of the embossed type character will be facilitated both by reason of the contrast thus afforded and the non-glare properties of the adjacent dull surface of the device.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawing which, by way of illustration, shows a preferred embodiment and the principle thereof and what I now consider to be the best mode in which I have contemplated applying that principle. Other embodiments of the invention embodying the same or equivalent principle may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawing,

Fig. 1 is a perspective view of the intaglio face of a typical printing device embodying my invention;

Fig. 2 is a fragmentary elevational view, drawn to an enlarged scale, of the intaglio face of the device shown in Fig. 1; and

Fig. 3 is an enlarged sectional perspective view taken substantially on the line 3—3 on Fig. 1.

The printing device illustrated in the accompanying drawing is, of course, merely illustrative of a wide variety of devices in which my invention may be embodied. The illustrated device D includes a substantially rectangular body B having spacing flanges F formed along the longer edges thereof by folding the marginal portions of the longer edges of the body over onto one face thereof. Ribs R are formed in the body B immediately inwardly of the spacing flanges F and project upwardly from what will be referred to hereinafter as the relief face of the printing device, that is, the face of the device on which embossed type characters appear in relief. The ribs R cooperate with the spacing flanges F to facilitate aligning of the printing devices one with the other in face-to-face relation, the purpose of the spacing flanges and these ribs being to protect the relief faces of type characters that are embossed on the body B. Notches N are formed in the shorter edges of the body B and cooperate with suitably located rails in the drawers in which the devices are filed for storage purposes to retain the devices in the drawers. Printing devices of the aforesaid character are produced from flat metallic strips of a thickness equal to that desired in the printing devices.

Type characters T are embossed in the body of the device as D in a suitable embossing machine, of which that disclosed in Duncan Patent No. 1,518,904, patented December 9, 1924, is exemplary. These type characters are so embossed in the body that they appear in relief on the face of the printing device from which the ribs R extend and in practice the type characters project from this face of the printing device, known as the relief face, in an amount slightly greater than the extent of the ribs R from such face. The type characters T appear in intaglio on the opposite face of the printing device, which is known as the intaglio face, and which is the face of the device D that appears in Figs. 1 and 2.

In the operation of embossing a type character on the body of a device as D, the embossing dies of the embossing machine, which may be of the character disclosed in Duncan Patents Nos. 1,048,459, 1,048,460 or 1,048,461, patented December 24, 1912, or in Duncan Patents Nos. 1,102,397 or 1,102,398, patented July 7, 1914, so operate that the metal of the body is depressed or dished toward the relief face in such a way that what may be called a platform is formed and the configuration of the particular type character or the like is raised from the medial part of this platform-like portion. Thus, in embossing the body B to afford a type character from which the letter "H" may be printed, what will be called a platform P is formed. This platform lies in a plane spaced well below the intaglio face of the device D and is joined to the body B by inclined side and end walls S and S' that extend in angular relation with the faces of the body. The side and end walls S and S' roundly merge into the body B and platform P as indicated at E and E' in the accompanying drawing. Furthermore, in forming the type character in the platform P, inclined side walls Z are afforded along the edges of the type character.

Thus, it will be seen that each type character, as that from which the letter "H" may be printed, is formed at the bottom of a dished or pan-like portion, when viewed from the intaglio face of the printing device. If, as has been the custom, the surfaces of this dished portion have light-reflective properties, conflicting reflections may arise when light falls on one or more of the walls Z, S and S' and edges E or E' and on the face of the printing device and on the face Y of the type character on the platform P and such conflicting reflections from the walls and edges of the type character and surface of the device make reading of the type character difficult.

Of course, when a plurality of type characters are embossed in side-by-side relation, as is done in forming type characters from which the name "John" may be printed, then the end walls S' of adjacent dished portions are aligned one with the other and a continuous end wall and platform are afforded and side walls as S are found only at the ends of the series of so interrelated dished portions. This affords relatively elongated end walls S' and edges E and E' and, in effect, protracted light-reflective surfaces disposed in angular relation with each other. I have observed that it is sometimes easier to read the type characters in the intermediate part of such a series, where reflections from side walls as S are not effective, than it is to read the type characters at the ends of such a series and in an instance where but a single type character is embossed, for the reflections from side walls as S appear to conflict with other reflections and reading of the type characters adjacent such walls S is markedly impaired.

I therefore propose to afford, and this invention resides in affording, a dull surface on at least one face of a printing device as D and thereby prevent objectionable light reflection from the surface. I have found that the provision of a dull or matte surface greatly facilitates reading of type characters embossed on a device including such a surface and this is especially true if the dull surface is afforded on the face of the device whereat type characters embossed thereon appear in intaglio.

A dull surface of the character contemplated by the present invention may be afforded by

chemically etching the metal either prior to the time the printing devices are formed therefrom or after the devices have been produced. If resort is had to chemical etching, the strip or the completed device is first thoroughly cleaned and preferably, though not necessarily, this is effected electrolytically by immersing the strip or strips or device or devices in an alkaline bath of which a solution of sodium hydroxide and sodium cyanide is exemplary, such cleaning of metal being well understood in the art.

Once the metal has been cleaned, it may be satisfactorily etched in any of a number of ways as by immersing the cleaned strip or strips or device or devices in dilute sulphuric or nitric acid or by dipping the same in hydrochloric acid. However, a particularly satisfactory etching solution for strips of zinc or devices made from such a strip consists of one ounce of ammonium dichromate, four ounces of sulphuric acid (66° Baumé) and four ounces of nitric acid (36° Baumé) with sufficient water to make one gallon of the solution. Strips or devices cleaned as aforesaid and immersed in this solution for from one to five minutes are found to be etched sufficiently for the purpose of producing the desired dull or matte surface of the present invention, and immersion for about one and one-half minutes appears to be the optimum time. After being removed from the etching solution the strips or devices are thoroughly rinsed in water and subsequently dried and possess a uniform dull grey surface free of a tendency to crack, peel or rub off.

Among other ways in which a dull or matte surface suitable for the purposes of the present invention may be produced on a printing device, and particularly where such a surface is desired on but one face of each device, is to resort to what is known as strip rolling. In strip rolling two metallic sheets are passed through a conventional sheet rolling mill in face-to-face contact under relatively high friction and in the course of such passage of the sheets through the mill a dull or matte surface is produced on each of the interengaged faces of the sheets. Moreover, resort may be had to sand blasting, wire brushing or the like to produce the desired dull or matte surface on the printing devices. In any event, whether resort is had to such mechanical production of the dull surface or whether such a surface is produced chemically, such a surface, within the purview of the present invention, will be afforded by minutely pitting at least one face of the device. When resort is had to mechanical production of the desired dull surface, it will be advantageous to produce the surface on the metallic strips from which the printing devices are to be formed prior to the production of the devices from such strips whereas if resort is had to chemical etching, this may be done either before or after formation of the device.

It is to be noted that if a coating, in contradistinction to minute pitting, is applied to the strips or devices to afford the desired dull surface such a coating might exhibit a tendency to chip or peel off and might tend to clog the embossing dies of the character employed in embossing machines such as that disclosed in Patent No. 1,518,904 referred to above, a condition which it is essential to avoid in order to insure satisfactory results. However, dull surfaces afforded by minute pitting do not produce objectionable clogging of the dies of an embossing machine of the aforesaid

character and are free of other and related objections.

When a dull surface is produced on a printing device in any of the ways hereinabove described, or in an equivalent manner, and one or more type characters are embossed on the device, a plurality of rounded or more or less angularly related surfaces are formed. Moreover, as an incident to the operation of the embossing dies, portions of the metal embossed to afford the type characters and especially those portions adjacent the base of the type character on the intaglio face thereof, indicated by Y and Z in the accompanying drawing, are somewhat burnished to thereby be rendered somewhat bright whereby light-reflective properties are imparted thereto. Hence, when light falls on the adjacent dull surfaces and also on the bright surfaces as Y and Z, a contrast is afforded between the burnished and somewhat bright and the dull surfaces which facilitates reading of the type characters. Furthermore, since the face of the printing device adjacent the embossed portions and upper parts of such portions are substantially free of light-reflective properties, conflicting reflections are not set up when light falls on such surfaces and this, coupled with the aforesaid contrast between the burnished or somewhat bright surfaces and adjacent dull surfaces, enable easy reading of the type characters.

Hereinabove, I have referred to use of this invention in one-piece printing devices and it is in such instances that the invention will be particularly useful. However, the invention may also be advantageously embodied in printing plates of the character disclosed in Gollwitzer Patent No. 1,955,803, patented April 24, 1934, for printing plates of this character also have type characters embossed therein, for example, in machines of the character disclosed in Patent No. 1,518,904, referred to hereinabove. The provision of at least one dull surface on printing plates of this character will facilitate the operator of such an embossing machine verifying whether or not the type characters embossed on a particular plate are those desired for here again the provision of a dull surface will facilitate reading the intaglio faces of the type characters.

The invention, however, will be primarily useful in so-called one-piece printing devices for the reason that it is necessary in all uses of such printing devices to read the type characters whereas a printing plate of the character disclosed in Patent No. 1,955,803, referred to above, is usually employed in a printing device of the character disclosed, for example, in Mohler Patent No. 1,812,894, patented July 7, 1931, which device includes an index card bearing an impression from at least selected of the type characters embossed on the plate of the device and this card is customarily read to ascertain what may be printed from the embossed type characters. However, since the invention will be useful in both one-piece printing devices and plates adapted for use in printing devices of the character disclosed in Patent No. 1,812,894, the term "plate" is used in the appended claims in the sense of being generic to one-piece printing devices and plates of the character disclosed in Patent No. 1,955,803.

While I have illustrated and described a preferred form of my invention, it is to be understood that this is capable of variation and modification and I therefore do not wish to be limited to the precise details set forth but desire to avail

myself of such changes and alterations as fall within the purview of the following claims:

I claim:

1. A printing plate on which type characters may be embossed and having a dull surface on at least one face thereof of such nature that at least a portion of such surface that is displaced in the operation of embossing type characters on the plate may be burnished in the embossing operation to thereby be contrasted with the adjacent dull surface on the plate.

2. A printing plate on which type characters may be embossed and having at least one face thereof so chemically etched that at least a portion of such surface that is displaced in the operation of embossing type characters on the plate may be burnished in the embossing operation to thereby be contrasted with the adjacent dull surface on the plate.

3. A printing plate on which type characters may be embossed and having at least one face thereof so mechanically treated that at least a portion of such surface that is displaced in the operation of embossing type characters on the plate may be burnished in the embossing operation to thereby be contrasted with the adjacent dull surface on the plate.

4. The method of producing a surface substantially free of light-reflective properties on at least one face of a printing plate adapted to have type characters embossed thereon which consists in so minutely pitting such surface that in the operation of embossing type characters on the

plate at least a portion of the minutely pitted surface that is displaced in the embossing operation may be burnished to thereby become contrasted with the adjacent surface that is substantially free of light reflective properties by reason of the pitting thereof.

5. The method of producing a surface substantially free of light-reflective properties on at least one face of a printing plate adapted to have type characters embossed thereon which consists in so mechanically producing a minute pitting of the surface that in the operation of embossing type characters on the plate at least a portion of the minutely pitted surface that is displaced in the embossing operation may be burnished to thereby become contrasted with the adjacent surface that is substantially free of light reflective properties by reason of the pitting thereof.

6. The method of producing a surface substantially free of light-reflective properties on at least one face of a metallic printing plate adapted to have type characters embossed thereon which consists in so chemically etching the metal that in the operation of embossing type characters on the plate at least a portion of a surface that is so etched and which is displaced in the embossing operation may be burnished to thereby be contrasted with the adjacent surface that is substantially free of light reflective properties by reason of the etching thereof.

CHARLES H. VAN DUSEN, Jr.