



# UNITED STATES PATENT OFFICE

2,425,338

## PRINTING PLATE AND REINFORCED CARRIER THEREFOR

Wilmer H. Nau, South Euclid, Ohio, assignor to  
Addressograph-Multigraph Corporation, Cleve-  
land, Ohio, a corporation of Delaware

Application August 13, 1942, Serial No. 454,679

8 Claims. (Cl. 101-369)

1

This invention relates to printing devices that embody carriers for printing plates and, desirably, index cards, such cards bearing impressions from at least selected of the type characters provided on the printing plates, and this invention primarily has to do with such carriers and plates and the retention of the printing plates on the carriers therefor.

It is quite advantageous to effectively reinforce printing device carriers of the aforesaid character for so to do enables such carriers and the printing devices of which they are a part to effectively withstand the stresses and strains to which they are subjected in uses to which they are put as, for example, during the insertion of index cards and plates into the carriers therefor and also during the passage of the assembled printing devices through the machines in which they are adapted to be used. Moreover, since printing device carriers of the character to which this invention pertains are usually substantially rectangular in outline so that one dimension thereof is longer than the other dimension thereof, it is advantageous to effectively reinforce such printing devices particularly in the direction of the longer extent thereof, and to enable the foregoing to be accomplished in a novel and efficient manner is among the important objects of this invention.

Yet further objects of this invention are to form reinforcing ribs in a printing device carrier, particularly in the portions thereof whereat one or more printing plates are to be installed thereon; to extend such reinforcing portions longitudinally in a substantially rectangular carrier of the aforesaid character; to arrange such portions for cooperation with a configuration imparted to a printing plate adapted to be inserted into the carrier on which such portions are provided; and to so arrange such portions and means effective to retain a printing plate in engagement therewith that once a printing plate is associated with such a reinforcing portion and the retaining means adapted for cooperation therewith the carrier will be effectively reinforced, particularly in the direction of the greater extent thereof.

Still further objects of this invention are to so form a printing plate that is adapted to be installed in a carrier of the aforesaid character that it will embody portions adapted for cooperation with reinforcing portions afforded in the carrier in which the plate is adapted to be received; to form flanges along opposite marginal edges of a substantially rectangular printing

2

plate and to space opposite faces of such flanges respectively beneath the planes in which opposite faces of the plate are disposed; to so arrange a printing plate of the aforesaid character that retaining means adapted to overlie marginal portions thereof may be arranged to cooperate therewith in such a manner as to be spaced well beneath the relief faces of type characters embossed on the plate; and to so form portions of a carrier that are adapted to cooperate with flanges or similarly formed portions along opposite edges of a printing plate that only a plate embodying a predetermined configuration can be inserted into such means.

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 front elevational view of a printing device embodying my invention;

Fig. 2 is a front elevational view of a printing plate of the character adapted to be utilized in the frame shown in Fig. 1;

Fig. 3 is a sectional view of the printing plate taken substantially on the line 3-3 on Fig. 2; and

Figs. 4 and 5 are sectional detail views taken substantially and respectively on the lines 4-4 and 5-5 on Fig. 1.

The printing device illustrated in the accompanying drawing embodies a frame or carrier, generally indicated by F, on one face of which a printing plate P and an index card C are adapted to be removably retained. The frame or carrier F is desirably formed from a substantially rectangular blank of sheet material and may advantageously be produced in the manner disclosed in Berthelsen Patent No. 2,070,573, patented February 16, 1937. It will be understood, however, that the frame may be produced in other ways without departing from the ambit of the present invention.

Desirably, the shorter marginal edges of the printing device frame are folded in the manner, for example, explained in the copending appli-

3

cation of Carl J. Hueber, Serial No. 450,320, filed July 9, 1942, to afford spacing flanges as SF along the shorter marginal edges and on what will be referred to hereinafter as the rear face of the frame or carrier F. Moreover, grooves as G are desirably formed adjacent to and inwardly of the shorter marginal edges of the frame as F so that the rails afforded on the spacing flanges as SF on one frame or carrier that is arranged above a frame or carrier as F may fit into these grooves to thereby facilitate stacking of the printing devices one upon the other and to be effective to prevent undesired lateral separation of the printing device, all as explained for example in the aforesaid copending application of Carl J. Hueber, Serial No. 450,320. Moreover, as explained in this copending application of Carl J. Hueber, the formation of spacing flanges as SF and grooves as G effectively reinforces a substantially rectangular frame or carrier as F along the shorter marginal edges thereof, such arrangements being effective to prevent undesired twisting or bending of the printing device carrier of the aforesaid character in transverse direction.

The grooves as G are formed in marginal panels PA which are disposed along the shorter marginal edges of the substantially rectangular frame F, these panels being disposed on the front face of the frame and having the exposed faces thereof arranged to lie in a substantially common plane. The portion of the frame or carrier F intermediate the panels as PA is depressed, as explained in the aforesaid copending application of Carl J. Hueber, Serial No. 450,320, to provide a pocket P1 in which the index card as C is adapted to be disposed and a pocket P2 in which a printing plate as P is adapted to be disposed, these pockets being separated one from the other by an upstanding rib R extended transversely across the frame F and having opposite end portions thereof respectively merged into the panels PA, the exposed face of the rib R desirably lying in the same plane as that in which the exposed faces of the panels PA are disposed.

The marginal portion of the blank from which the frame as F is formed, intermediate the panels PA, is desirably folded toward the face of the frame or carrier F to afford a rounded upper edge 10 along the upper edge of the frame, the portion of the frame that is so folded terminating in a portion 11 that extends in spaced apart but substantially parallel relation with the adjacent face of the pocket P1, and this portion 11 merges into a crimped portion 12 which is disposed intermediate the portion 11 and a flange 13 that is inclined, preferably on a slight radius toward the adjacent face of the pocket P1 but which terminates in spaced apart relation therewith so as to enable an index card as C to be freely inserted therebelow, the free marginal edge of an index card so inserted beneath the flange 13 being adapted to lie between adjacent faces of the pocket P1 and the formed portion 11. The parts that are folded over onto the face of the frame F, as just described, afford what will be referred to hereinafter as an upper bead UB, and by reason of the formation of the crimped portion 12 in this bead UB, which crimped portion is in effect a rib, and the formation of the bead as UB, effective reinforcement longitudinally of the frame or carrier F adjacent the upper edge thereof is afforded.

The portion of the frame F that is depressed to afford the pockets P1 and P2 is joined along opposite edges thereof to the panels PA by inclined

4

portions 14 and the bead UB, as best shown in Fig. 1, desirably has the opposite edges thereof terminated in spaced relation with these inclined portions 14. Moreover the end portions 15 of the flange 13 of the bead UB are desirably extended in substantially parallel relation with the adjacent face of the pocket P1 so that an enlarged entrance is afforded at, for example, the right-hand end of the bead UB as it is viewed in Fig. 1 to facilitate the insertion of the marginal portion of an index card C beneath the flange 13 of the bead UB, the portion 15 provided at the opposite end of the bead UB desirably being arranged similarly to contribute to symmetry of appearance in the bead UB.

The marginal portion of an index card as C that is inserted into the bead as UB is adapted to be passed beneath retaining devices such as the lips L1 that are struck from the underlying portion of the bottom of the pocket P1 and the adjacent vertical wall of the rib R, and these lips as L1 are desirably arranged to have the exposed faces thereof disposed in the plane in which the exposed faces of the rib R and panels PA are disposed. The opposite marginal edges of the lips as L1 are desirably slightly inclined upwardly, and such upward inclination along the right-hand edges of such lips as they are viewed in Fig. 1 facilitates the insertion of an index card therebelow. In this respect it will be understood that an index card C is inserted into the bead UB and the lips L1 from the right-hand side of the frame as F as it is viewed in Fig. 1, and in order to prevent the leading edge of an index card as C from riding up the inclined portion 14 at the left-hand side of the frame as it is viewed in Fig. 1, a combined stop and retaining means SR is afforded by a gusset plate which extends between the exposed faces of the panel PA and the end of the rib R at the left-hand side of the frame F as it is viewed in Fig. 1, this gusset plate being spaced from the adjacent face of the pocket P1 so that the lower corner at the leading end of an index card C inserted into the carrier may pass therebelow. In order to insure that an index card as C will be effectively retained in the pocket P1 once it has been inserted therein in the manner just described, a lip L3 is struck from the panel PA at the right-hand side of the frame as it is viewed in Fig. 1 desirably in juxtaposition to the bead UB, this lip L1 extending inwardly from the aforesaid panel PA over the adjacent inclined part 14, and when an index card is inserted into the pocket P1 the trailing edge thereof is caused to pass beyond the free marginal edge of the lip L3 so as to thereby enable this free marginal edge to thereafter be passed beneath this lip.

A lower bead LB is provided along the lower marginal edge of the frame F by folding a portion of the material of the blank from which the frame F is formed over onto the face of the frame F, the opposite end portions of a bead as LB desirably being spaced slightly inwardly from the inclined parts 14 in the same manner as that in which the end portions of the bead UB are spaced from these inclined parts. The material of the frame from which the blank F that is thus folded over onto the face of the frame F to afford the lower bead LB is formed is folded to provide a rounded edge 16 at the lower edge of the frame, and the free marginal portion of the portion that is so folded affords a flange 17 that is arranged to extend in parallel but spaced

5

apart relation with the plane in which the adjacent face of the pocket P2 is disposed.

However, in order to effectively reinforce the frame F along the lower marginal edge thereof the marginal portion of the frame F immediately inwardly of the rounded edge 16 is offset so as to have the exposed face thereof disposed above the plane in which the adjacent face of the pocket P2 is disposed so as to thereby afford a panel 18 that is connected to the portion of the frame F that affords the bottom of the pocket P2 by an offset portion 19 which is in the nature of a rib and which is therefore effective, in cooperation with the configuration of the bead LB, to reinforce the frame F longitudinally and at the lower edge thereof.

While the rib R is effective to reinforce the frame F longitudinally thereof medially between the beads as LB and UB, I have found that by providing an offset panel 20 in the frame F adjacent the rib R additional longitudinal reinforcement may be imparted to the frame F medially thereof. The panel 20 is formed by offsetting the material of the frame adjacent the rib R and in the portion thereof affording the pocket P2 so that the front face of the panel 20 lies in the same plane as that in which the front face of the panel 18 is disposed, the portion that is so offset to afford the panel 20 being connected to the portion of the material providing the pocket P2 by the offset portion 21 which, like the offset portion 19, is in the nature of a rib and which therefore is effective to provide longitudinal reinforcement for the frame longitudinally and substantially medially thereof.

A printing plate as P is adapted to be inserted into the pocket as P2 so as to have opposite marginal edges thereof disposed in engagement with the front faces of the panels 18 and 20 and to this end flanges 22 and 23 are formed along the opposite longer edges of the substantially rectangular plate as P. Desirably the flanges as 22 and 23 are formed on the plate as P by a swaging operation as by rolling, coining or extruding for so to do enables sharp edges and corners to be eliminated from the flanges as 22 and 23, and moreover such an operation in effect irons the material of the plate that is deformed to afford such flanges so as to thereby strengthen the same. Moreover, the flanges 22 and 23 are arranged to have opposite faces thereof disposed in substantially parallel relation one with the other and these opposite faces of the flanges 22 and 23 are respectively offset or rabbeted beneath the planes in which the opposite faces of the substantially flat plate P are disposed, and desirably the opposite faces of the flanges 22 and 23 are equidistantly offset from the respective and adjacent faces of the plate as P.

As best shown in Fig. 4, the flange 23 on the plate as P is adapted to be inserted into the space between the flange 17 and the front face of the panel 18, and this may be effected by sliding the plate into the channel that is thus afforded either from the right-hand end or the left-hand end of the frame F as it is viewed in Fig. 1. Moreover, lips as L2 are struck from the adjacent portion of the panel 20 and the adjacent vertical wall of the rib R to have the exposed faces thereof extended in the plane in which the exposed face of the rib R is disposed, the lips L2 therefore extending in substantially parallel but spaced apart relation with the front face of the panel 20 so as to thereby enable the flange as 22 on a plate as P to be inserted into the channel

6

defined between adjacent faces of the lips L2 and the panel 20, the flange 22 passing into this channel as the plate is passed into the channel between adjacent faces of the flange 17 and the panel 18. In this respect it will be noted that the panels 18 and 20 are offset from the bottom of the pocket P1 in an amount substantially equal to the spacing of corresponding faces of the flanges 22 and 23 from the face of the plate P that is adapted to be engaged with the front face of the bottom of the pocket P2 when the plate is inserted into this pocket in the manner described hereinabove. Therefore, when a plate as P is inserted into the pocket P2 one face thereof lies against the bottom of the pocket P2 and corresponding faces of the flanges 22 and 23 respectively engage the front faces of the panels 18 and 20.

Desirably, the end portions of the lips as L1 and L2 are slightly inclined upwardly to afford enlarged entrances therebelow to facilitate the insertion of a flange as 22 into the channel between such lips and the adjacent face of the panel as 20. It will therefore be seen that once a plate as P is inserted into position beneath the lips as L2 and the flange as 17 the plate is held against the face of the bottom of the pocket P2 and the plate P and the frame F are held against lateral or face to face separation.

While in many uses to which a printing device of the character to which this invention pertains may be put the inclined parts 14 will be effective to prevent longitudinal displacement of a printing plate as P from the pocket as P2, in many instances it may be desirable to effectively insure against such longitudinal displacement of the plate from the pocket P2. In such circumstances, spring tongues as ST of the character, for example, disclosed in the aforesaid copending application of Carl J. Hueber, Serial No. 450,320, may be provided at opposite ends of the pocket P2, such tongues being yieldable and depressible so as to thereby enable stops as S formed thereon to be moved out of cooperating relation with the adjacent end of a plate as P so as to thereby enable a plate as P to be slid thereover and be removed from the pocket P2. In this respect it will be understood that one or the other of the spring tongues ST is depressed when a plate as P is adapted to be inserted into a pocket as P2.

Type characters as T are customarily embossed on a printing plate as P in, for example, an embossing machine of the kind disclosed in Duncan Patent No. 1,519,904, patented December 9, 1924, or in a similar apparatus. Plates suitable for such embossing are commonly made of sheet metal or sheet plastic material having suitable embossing properties and of sufficient thickness and innate strength to resist deformation of printing characters embossed thereon when subjected to printing pressure in a printing apparatus. The thickness of such plates however must not exceed that which will impair the embossing of printing characters on the plates to appear in relief on one face thereof and in intaglio on the opposite face, especially when such printing characters are embossed on the plates in embossing machines of the kind referred to hereinabove and in common use. In practice it has long been known that plates of the aforesaid character should not be substantially more than .030" in thickness and printing plates of the aforesaid character as these have been long used

in the art and have ranged in thickness between .012" and .020".

Inasmuch as printing devices of the character to which this invention pertains are often passed seriatim through a machine of the character disclosed in the copending application of Carl J. Hueber, Serial No. 388,998, filed April 17, 1941, now Patent No. 2,359,850, patented October 10, 1944, a notch as N may advantageously be formed in one of the shorter marginal edges of the frame as F, such a notch desirably being arranged in the manner described in Gollwitzer Patent No. 2,132,412, patented October 11, 1938, and being utilized, for example, in the manner described in detail in Gollwitzer Patent No. 2,132,414, also patented October 11, 1938.

Another very important advantage which accrues from affording flanges as 22 and 23 on a plate as P is that such flanges are not only arranged for cooperation with reinforcing arrangements such as those including the panels 18 and 20, but the spacing of corresponding faces of flanges 22 and 23 beneath the face of a printing plate as P on which type characters as T are embossed to appear in relief enables the exposed faces of the retaining devices on the carrier adapted to overlie marginal portions of such a printing plate to be so spaced below the plane in which the relief faces of the embossed type characters are disposed so that the likelihood of objectionable impressions being made from such retaining devices is avoided. Thus by referring to Fig. 4 it will be seen that the exposed faces of the lips as L2 and flange as 17 are so spaced beneath the relief faces of the type characters as T that are embossed on the plate as P that ample clearance is afforded between such relief faces of the type characters and the exposed faces of the retaining devices as the lips L2 and the flange 17, such clearance being sufficient to insure that the impression-making member in the machine in which printing devices of this character are utilized will cooperate with the relief faces of the type characters to produce impressions without coming in contact with the exposed faces of the retaining devices, and it is this that insures against objectionable impressions being made from the retaining devices for the plate as P.

While the printing device carrier as illustrated in the accompanying drawings embodies two longitudinally extending panels for the purpose of imparting reinforcement thereto, it will be understood that one or the other of such panels might be eliminated without departing from the purview of the present invention for in many instances one such panel will impart sufficient longitudinal reinforcement to the frame. It will be understood, however, that if one such panel is omitted it will not be essential that there be any modification of the flanges as 22 and 23 on the printing plate as P nor need there be any substantial modification of the retaining means on the carrier adapted for cooperation with such flanges. The reason for this is that even if one of the panels 18 or 20 is omitted the printing plate such as the plate P may still be inserted into a frame or carrier as F having but one such panel. In such an instance the face of the flange 22 or 23 that would normally cooperate with a panel as 20 or 18 will merely be spaced from the underlying portion of the bottom of the pocket P2 in the instance where the panel 20 or 18 is omitted. In this respect, however, it will be advantageous to provide a panel as 18 for such

a panel is effective to reinforce the carrier along the lower edge thereof, and this, in cooperation with the longitudinal reinforcement imparted to the frame or carrier as aforesaid along the upper edge thereof, will, in most of the uses to which a printing device of the character to which this invention pertains, impart sufficient reinforcement to the frame.

Further with respect to the foregoing, however, it will be understood that if, for example, a panel as 20 is omitted, then the configuration imparted to a flange as 22 that is adapted to cooperate with such panel may be omitted in the event that this should be desired, and in such an instance the printing plate would embody but one flange having both faces thereof spaced from opposite faces of the printing plate. Since, however, it is advantageous to include two such flanges on the printing plate, it is preferred that the novel printing plate of this invention be formed in this manner.

It will be manifest from the foregoing description that I have provided a printing device which is effectively reinforced longitudinally thereof both along the upper and lower marginal portions thereof. This is accomplished in accordance with the hereinabove described preferred form of my invention by forming longitudinally extending panels in the carrier of the printing device in position to cooperate with complementarily formed portions on a printing plate adapted to be installed on the carrier. Moreover, I have so arranged a printing plate that is adapted to be used on a carrier of the aforesaid character that marginal edges are afforded thereon which are not only adapted to cooperate with reinforcing panels afforded on the carrier but which are also so arranged as to cooperate with retaining means afforded on the carrier that are adapted for cooperation therewith that impressions may be made from the relief faces of type characters embossed on the plate without the likelihood of impressions being made from the retaining means that overlie opposite marginal portions of the plate.

Many other advantages of the present invention will be apparent to those skilled in the art from the accompanying drawing and foregoing description and it is to be understood that while I have illustrated and described a preferred embodiment of my invention, 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 flat printing plate of not substantially more than .030" in thickness on which type characters may be embossed to appear in relief on one face and in intaglio on the opposite face thereof, and a swaged marginal portion of reduced thickness extended along at least one marginal edge of the plate embodying a rounded free edge and having rounded corners at the free ends thereof, said portion including oppositely arranged faces parallel to the faces of the plate that are respectively disposed to lie below the planes of the opposite faces of the plate.

2. A flat printing plate of not substantially more than .030" in thickness on which type characters may be embossed to appear in relief on one face and in intaglio on the opposite face thereof, and swaged marginal flanges of reduced thickness extended along opposite edges of said

plate each embodying rounded free edges and having rounded corners at the free ends thereof, each such flange including substantially parallel faces that are respectively disposed below and parallel with the opposite faces of said plate.

3. A printing device including a carrier, an embossable printing plate, means for securing the plate on one face of the carrier and including retaining means adapted to overlie at least selected of the marginal portions of the plate, said plate being formed from sheet material and including a rabbeted flange of reduced thickness, along at least selected marginal edges thereof that are adapted to be disposed under at least selected of the retaining means, each such selected of the retaining means being formed to project over and closely overlie the flange on the plate that is adapted to be disposed thereunder, and a formed portion in said carrier affording a reenforcement therefor and disposed to underlie a flange of reduced thickness along a marginal edge of the printing plate when said plate is installed in said carrier, such flange embodying a configuration that is complementary to said formed portion in the carrier.

4. A printing device including a carrier, an embossable printing plate, means for securing the plate on one face of the carrier and including retaining means adapted to overlie opposite marginal portions of the plate, the opposite marginal portions of the plate that are adapted to underlie the retaining means for such opposite marginal portions of the plate being rabbeted to provide flanges of reduced thickness, the retaining means adapted for cooperation with such portions of the plate being formed to closely overlie such flanges, and a formed portion in said carrier affording a reenforcement therefor and disposed to underlie one of the rabbeted flanges on the plate when said plate is inserted into said retaining means, the rabbeted flange of said plate that overlies the formed portion in the carrier being so formed as to be complementary to the formed portion in the carrier.

5. A printing device carrier adapted to have at least one printing plate mounted thereon and including means for securing the plate thereto, comprising a carrier body portion and a formed portion in said carrier along one marginal edge thereof and above which a marginal edge of the plate is adapted to be disposed when the plate is mounted on the carrier, said formed portion having elements out of the plane of the body portion constituted and arranged to afford a reenforcement for said body portion of said carrier along said edge thereof.

6. A printing device carrier adapted to have at least one printing plate mounted thereon and including means for securing the plate thereto, said carrier having beads formed along opposite marginal edges thereof and one of said beads having a configuration imparted thereto that is effective to reenforce the marginal portion of the carrier along which such bead is disposed, such bead being located along the edge of the carrier opposite that along which the marginal portion of the printing plate is adapted to be disposed, the other of the beads being formed to overlie a marginal portion of the printing plate, and a formed portion on said carrier underlying the bead adapted to overlie

the marginal portion of the printing plate, said formed portion being constituted and arranged to afford a support for an edge of said plate and a structural reenforcement for the portion of the carrier in which it is provided.

7. A printing device carrier adapted to have at least one printing plate mounted thereon and including means for securing the plate thereto, said carrier having beads formed along opposite marginal edges thereof and one of said beads having a configuration imparted thereto that is effective to reenforce the marginal portion of the carrier along which such bead is disposed, such bead being located along the edge of the carrier opposite that along which the marginal portion of the plate is adapted to be disposed, the other of the beads being formed to overlie a marginal portion of the printing plate, and a raised panel on the carrier underlying the bead adapted to overlie a marginal edge of the printing plate, said raised panel being adapted to underlie and support the same marginal edge of a plate and including a rib which is effective in cooperation with the panel and the bead under which the panel is disposed to reenforce the carrier.

8. A printing device carrier adapted to have mounted thereon at least one printing plate having a flange along at least one marginal edge thereof that has at least one face thereof offset from and parallel with a face of the plate, said carrier comprising means for securing the plate thereto that include an inturned bead along one edge of the carrier and at least one raised panel on the carrier spaced from and parallel with said inturned bead and disposed thereon in a position to underlie the flange on the printing plate when the same is mounted on the carrier, said raised panel providing a supporting surface for the flange on the printing plate and providing a rib projecting out of the plane of the carrier which with the panel affords a reenforcement for the carrier.

WILMER H. NAU.

#### REFERENCES CITED

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

#### UNITED STATES PATENTS

Number	Name	Date
1,026,244	Duncan	May 14, 1912
1,872,173	Paschali	Aug. 16, 1932
834,795	Laycock	Nov. 13, 1906
1,928,161	Wood	Sept. 26, 1933
478,750	Horgan	July 12, 1892
1,550,259	Jackson	Aug. 18, 1925
1,921,202	Mungen	Aug. 8, 1933
1,951,596	Creesy	Mar. 20, 1934
2,039,074	Farrington	Apr. 28, 1936
1,087,223	Duncan	Feb. 17, 1914
146,454	Hughes	Jan. 13, 1874
743,759	Severy	Nov. 10, 1903
2,074,587	Illium	Mar. 23, 1937
1,680,819	Steindorf	Aug. 14, 1928
1,302,850	Rand	May 6, 1919

#### FOREIGN PATENTS

Number	Country	Date
330,432	Great Britain	June 12, 1930