

[54] TYPE DISC AND METHOD OF MAKING
SAME

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[52] U.S. Cl. 197/53; 197/36

[51] Int. Cl. B41j 1/32

[58] Field of Search 197/18, 53, 54, 36;
101/398-401, 401.4, 368, 379, 380

[56] References Cited

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[57] ABSTRACT

Metal font plates secured to heads of a type disc. Plates are made by depositing a thin coating of metal in a mold which has characters imprinted therein. The plates with the various characters are segregated and secured to the heads of the type discs.

1 Claim, 6 Drawing Figures

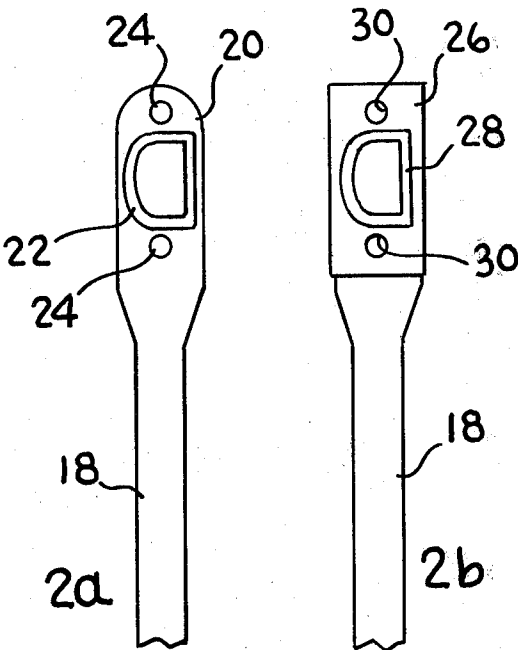


FIG. 1

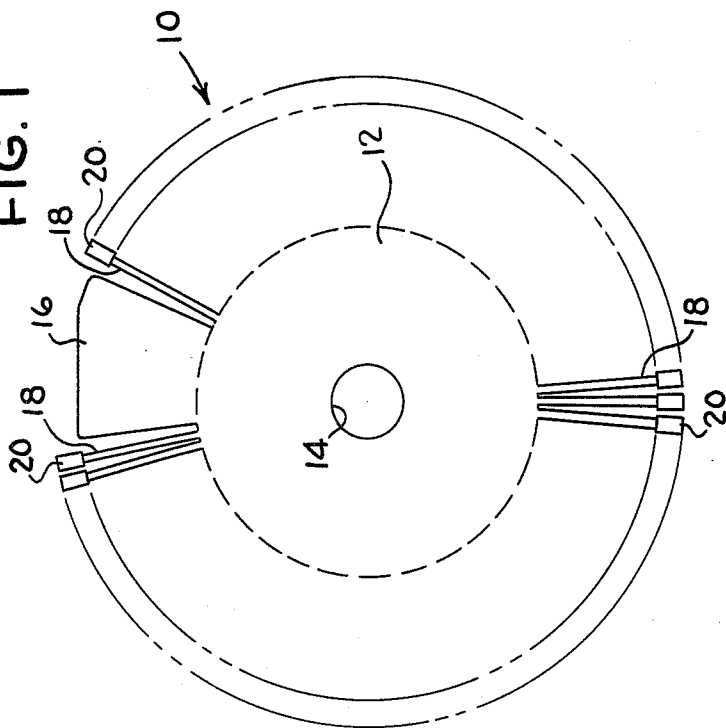


FIG. 3

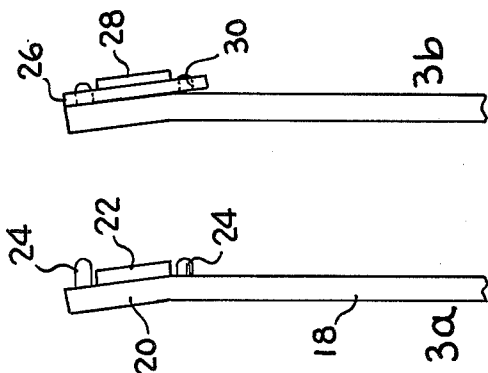


FIG. 2

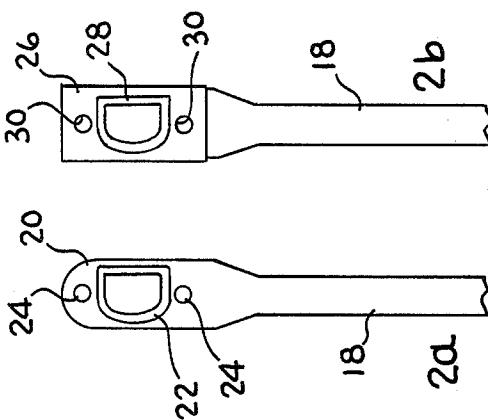


FIG. 4

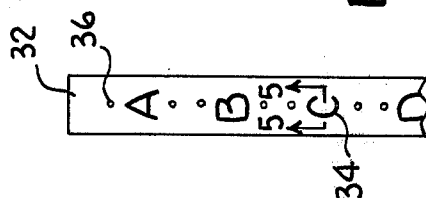


FIG. 6

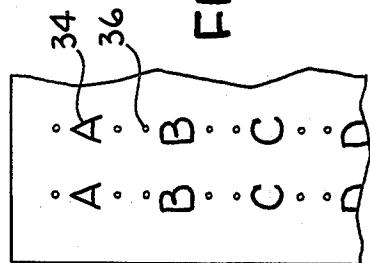
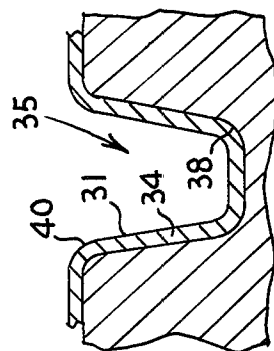


FIG. 5



TYPE DISC AND METHOD OF MAKING SAME

CROSS REFERENCE TO RELATED APPLICATION

Reference is made to commonly assigned U.S. patent application, Ser. No. 373,196 entitled, "Printing Disc for Printing Machine", filed June 25, 1973, the disclosure of which is incorporated in its entirety herein.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to type-holding discs and more particularly to a means for increasing the durability of such discs.

2. Description of the Prior Art

It is desirable in automatically, or remotely, operated printing machines that have type-holding discs or wheels to have type-holding discs or wheels that are light in weight and that are long wearing. In present day type-holding discs the heads bearing the type are generally made of a plastic material, as is the balance of the disc. Using plastic has certain advantages in that it allows flexibility, the type is readily formed, and the cost of preparing these discs is relatively low. There are certain shortcomings, however, with the use of a disc having a plastic type carrying head. Because of the light weight of the plastic, printing quality tends to be relatively poor because of the limits of energy that can be generated in the printing operation. If too much energy is imparted to the plastic heads, the type carried thereby would tend to flatten upon impact. On the other hand, if too little energy is imparted, low printing density results.

In order to overcome this shortcoming of a plastic head, it has been suggested, as in the above cross referenced co-pending application, to plate the head with a heavier, long-wearing material, such as a metal. Although the plating of the type carrying head has been materially aided in overcoming some of the previous problems, it has not proven completely satisfactory. When a plastic head is treated for a plating operation, the surface of the head is etched, as with an acid. This etching process is somewhat critical as the head must be roughened to an extent that it can readily receive a plating, but, on the other hand, the etching must not be carried out to such an extent that the surface of the type is materially damaged. Another shortcoming of plating the head is that after a number of uses, there is the possibility of the plating becoming segregated from the head.

It has been found that all the above disadvantages, not only in the plating, but in the characters of the head itself, may be overcome by physically applying to the face of the head a metal plate having a character embossed thereon.

SUMMARY OF THE INVENTION

A type-holding disc is prepared substantially as is the present practice in the use of an all plastic type carrying disc. The head of the disc is provided with means by which a metal plate may be secured thereto, as for example, a projecting member, such as a nib, extending from opposite sides of a character on the face of the head. A plurality of plates is prepared, each having a character of the type to be used in the printing machine. These plates may be prepared in any manner, but the preferable way is to produce them by electro-

plating in a mold. The individual plates each has a means for receiving the securing means which is integral with the head, as for example openings which receive the nibs.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a plan view, partially schematic, of a type-holding disc to which this invention may be applied.

FIG. 2 shows a frontal view of an arm of the type-holding disc, before and after a font plate has been secured thereto.

FIG. 3 shows a side view of an arm of the type-holding disc, before and after a font plate has been secured thereto.

FIG. 4 shows a plan view of a portion of a mold wherein a single set of font plates may be made.

FIG. 5 is a cross-sectional view of the mold of the FIG. 4 taken along the lines 5-5.

FIG. 6 is a plan view of a portion of a mold wherein a plurality of font plate sets may be made.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing, a type-holding disc of the kind to which this invention may be adapted is shown generally at 10 and has a central or base portion 12 with a circular configuration. The central portion 12 has an opening 14 therein, which provides means for securing the disc 10 to a printing apparatus. The central portion 12 also includes a solid peripheral region 16. Extending circumferentially about the central portion 12 are a plurality of flexible arms 18, each having a head 20 at the end thereof. Deposited upon each head 20 is a type or character 22 as shown in FIG. 2 and FIG. 3. As will be noted, the character 22 shown in FIG. 2 is that of a "D". Extending from the upper and lower sides of the head 20 immediately adjacent the character 22 are a pair of projections or nibs 24. The type disc 10, including the central portion 12, the peripheral region 16 and the arms 18 are preferably made of a plastic material such as "Delrin" which is a trademark of E. I. DuPont de Nemours, Inc. for its brand of acetal homopolymer or "Celcon" which is a trademark of Celanese Plastics Co. for its brand of copolymer of formaldehyde and ethylene oxide. Other plastics may be used, such as polysulfone.

Secured to the face of the head 20 is a font plate 26 having an embossed character 28 therein which character matches in all respects the character 22 originally found on the head 20 and which is integral therewith. The reason for having the character 22 integral with the head as well as having the same on the plate is to eliminate any possibility of physical damage to the embossed character 28 upon repeated impacts. Essentially, the character 22 on the head 20 acts as a backing material for the embossed character 28.

Referring now to FIGS. 4 and 5, the font plates 26 are made by applying a thin coating of metal 31, such as copper, nickel or chromium, to the face of a mold 32. The preferable method of applying the coating is by electroplating as this provides sufficient control to achieve a coating of uniform thickness. The mold has a plurality of character impressions 34 therein which form the embossed characters 28 of the font plates 26. The character impressions 34 in the mold 32 may be made in any way, such as by stamping or engraving.

It was stated previously that means has to be provided for securing the font plate 26 to the head 20. For this purpose, an opening 30 is provided in the font plate 26. It is preferable that means be provided in the mold 32 for creating such an opening 30. Such a means would include having a spot 36 on the mold such that it will not have metal attached thereto; i.e., the spot will not be wet by the coating metal. One method of making such a spot is to drill a small opening 36 in the mold and filling the same with a non-wetting material such as an epoxy. The plates 26 are attached by placing the same onto the heads 20 in a manner that the openings 30 receive the nibs 24. After attachment, the nibs 24 are deformed or flattened to secure the plates 26. Obviously other ways of producing openings 30 in the plate 26, as for example, by having appropriate projects in the mold 32, or by drilling openings after the plate is formed. Other means for securing the plates 26 to the heads 20 may also be devised, as by forming clips on the plates during electroplating.

FIG. 5 shows a cross section of the mold 32 through one portion of a character such as the letter "C". The cavity is shown generally at 35 and includes an inner corner 38 and an outer corner 40. As the metal 31 is electroplated onto the mold 32, the characters will have the tendency to form sharp images as the inner corner 38 of the mold does not change the configuration of the character regardless of how much metal is applied therein. The same thing is true of the outer corner 40 of the mold and the configuration of the character stays the same regardless of the quantity of the

metal 31. It is preferable that the coating be relatively thin in order to prevent the font plate 26 from being too heavy and thereby having too high an inertia. It will be appreciated that with a thin coating of this nature the font plate 26 will tend to be hollow.

It will be obvious that a number of font plates 26 may be produced by using a mold having a multiplicity of sets of character impressions 34. An example of such a mold is shown partially in FIG. 6 where a plurality of rows of letters, each row containing the letters of the alphabet.

What is claimed is:

1. A printing disc assembly constructed of a composite of structural members, said assembly comprising:

- 15 A. a disc shaped member having a plurality of flexible plastic arms radially extending outwardly from a hub portion of said disc member, said arms each having a head section at an outer portion thereof, each of said head sections having a character disposed thereon; and
- 20 B. a plurality of metal print character members annularly arranged with respect to each other and each having a character and securing means, each of said character members being respectively secured to an end portion of a corresponding arm by means of said securing means, thus forming a composite printing disc assembly, each character of said metal print members correspondingly disposed over and upon a matching character of the head sections, so as to form integral character composites.

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