Jan. 28, 1947. M. REYNOLDS ET AL 2,414,895

PRINTING APPARATUS

Filed Oct. 6, 1943

Fig. 1

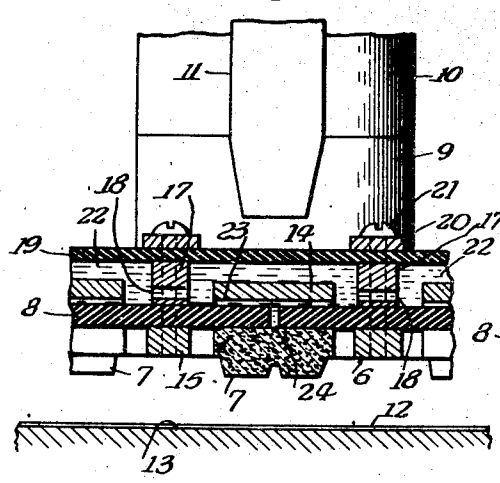


Fig. 2

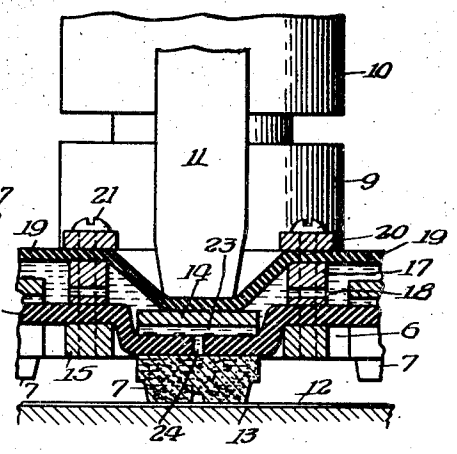


Fig. 3

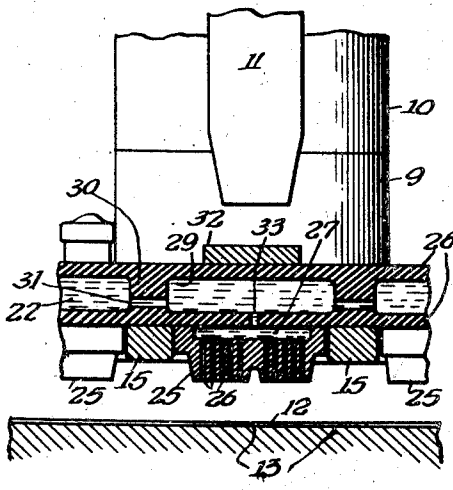
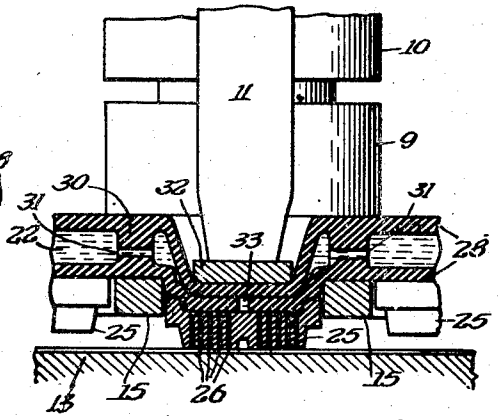


Fig. 4



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PRINTING APPARATUS

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12 Claims. (Cl. 101—103)

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This invention relates generally to printing apparatus and is more particularly described as an inking device for such apparatus which comprises a movable type carrier with a flexible diaphragm having printing types or characters on one side, adapted to be moved for bringing various types or characters into printing position, and the flexible diaphragm being depressed and distorted to apply the type to a surface to be printed.

In applying ink to printing apparatus of this character, it has heretofore been necessary to move an inking roller or other device over the surface of the type to be printed for each impression of the type, or after a very few impressions of it, thus requiring a more or less complicated and cumbersome inking device and at the same time delaying or complicating the printing operation so that less work can be turned out in a given time.

The principal object of the present invention is to provide improved printing means which includes an inking reservoir as a part of the flexible disc, together with a pervious type or printing character arranged and disposed in such a manner that when pressure is applied to the top carrying holder, for distorting it and effecting the printing, a small amount of ink will be forced into and through the printing character until it appears upon the printing face thereof and will be applied to any surface which is engaged by the printing type or character.

Another object of the invention is to provide a printing type or character which is made of pervious material such that ink can be applied to the printing surface thereof from the back or other portion of the type.

A further object of the invention is to provide a pervious type for receiving inking material at one side which is forced under pressure through the material to the printing face thereof.

Still another object is to provide an improved printing apparatus in which a number of types or characters are mounted in connection with a reservoir of inking material so that any one of the types may receive ink from the common reservoir and when one type is to be printed, it will be supplied with sufficient ink upon its printing face to produce the desired printing impression.

A still further object of the invention is to provide an improved inking device which is generally of new and improved construction and is characterized by simplicity of design as well as ease or facility of assembly.

Other objects of the invention and the various advantages and characteristics of the present

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printing device will be pointed out in the specification and will be apparent from the accompanying drawing.

The invention consists in the several novel features which are hereinafter described and more particularly defined by the claims at the conclusion thereof.

In the drawing which accompanies and forms a part of this specification or disclosure, and in which like letters and numerals of reference denote corresponding parts throughout the several views:

Fig. 1 is a view partly in section illustrating one form of the invention in raised position prior to the printing operation;

Fig. 2 is a view of the structure shown in Fig. 1 in printing position;

Fig. 3 is a view partly in section illustrating a modified form of printing device in a raised position; and

Fig. 4 is a view of the structure of Fig. 3 in printing position.

This inking device is described as a part of a printing apparatus which has a rotatable or movable type carrier 6 in which various types or characters 7 are carried at one side of a flexible disc 8. This disc may be movable transversely or rotatably mounted for type selecting movement on a plunger 9 which is also vertically reciprocable in a holder 10. In other words, the characters 7 are arranged at different distances from the axis of the plunger 9 which is rotatable and movable horizontally with the holder for selecting any type 7 to be moved to the printing position. The plunger 9 is longitudinally movable in the holder 10 and together they are bodily movable with respect to a surface to be printed to bring other types into a printing position.

To effect the printing after any type is moved into printing position, the plunger 9 is moved downwardly and with it, an operating bar 11 which engages the back of the flexible disc distorting the disc and applying the printing face of the type 7 to the surface of a sheet 12 disposed upon a suitable base 13 below the type carrier.

In order to equally apply any one of the types 7, a back plate 14 is preferably mounted on the flexible disc 8 opposite each of the types so that when the extremity of the operating member 11 engages it, the flexible disc will be evenly distorted and deflected in applying the type.

The type carrier 6 comprises ribs 15 forming openings 16 within which the type 7 are mounted. The flexible disc is mounted on top of the ribs so that the types project between and through

the space formed by the ribs. On top of the disc 8 is another corresponding ribbed structure 17 having transverse openings 18 therethrough. On top of these ribs is a flexible diaphragm 19 which is held in place by a ribbed clamping plate 20 and by fastening screws 21 which extend therethrough and through the diaphragm 19, the ribs 17, and the lower disc 8 into the lower ribs 15 thereby binding all of the carrier parts together. This provides a hollow structure between the disc 8 and the diaphragm 9 separated by the ribs 17 and connected by openings 18 between adjacent sections of the hollow structure which more or less restrict the passage of a liquid 22 which is placed in its hollow space from passing rapidly from one section or portion thereof to the other.

Each back plate 16 is provided with one or more transverse grooves 23 at the lower face thereof in contact with the upper face of the flexible disc 8, and in the flexible disc at the back of each letter or character 7 are a plurality of corresponding openings 24 which form communication from the hollow chamber to the back of the printing type or character. Each printing type or character is preferably composed of porous material such as sponge rubber or other pervious material which allows the passage of a liquid such as printing ink from the back through the body of the material to the printing face thereof.

Under ordinary circumstances, when the type carrier is raised for letter changing movement, the printing liquid is contained in the hollow chamber between the disc and the diaphragm with little tendency to exude or pass from this chamber into and through the pervious type letter or character. When the operating bar 11 is moved downwardly as shown in Fig. 2, the depression of the diaphragm 19 reduces the space between the adjacent ribs for the selected printing character, and because of the restricted passages 18, causes a temporary compression of the liquid in that portion of the hollow section such that the ink or liquid is forced under slight additional pressure from the hollow chamber through the grooves 23 and openings 24 to the back of the type or character 7 and thence through the character to the printing surface thereof so that upon contact of the type with a sheet 12 or other surface to be printed, the ink is applied thereto.

In the form shown in Figs. 3 and 4, a similar arrangement and operation of parts are shown, but the type characters 25 are pervious to the extent that they are provided with relatively small perforations 26 extending from front to back thereof, and in the back opposite the ends of the perforations is a recess 27. A disc or diaphragm 28 is shown with a plurality of hollow sections 29 corresponding to each of the types 25 separated by partitions 30 in which are restricted passages 31. At the top or outside of the disc is a contact plate 32 which is engaged by the operating bar 11 to distort the two walls of the type carrier disc 28 in effecting the printing operation as shown in Fig. 4.

The size of the contact plate 32 is preferably somewhat less than that of the openings 27 so that when the opposite walls of the disc 28 are distorted and depressed, the wall in contact with the plate 32 will first be forced against the opposite wall which will then be depressed and forced into the recess 27. In order to permit this depression and to cause a compressing action of liquid in the recess 27, one or more openings 33 are provided in the lower wall of the disc 28

forming communication with the hollow space of the disc and the space formed by the recess such that when the operating bar is depressed, the upper wall will first close the opening or openings 33 and the further movement of the two walls into the recess 27 will force the liquid therein under pressure through the pervious openings or passages 26 to the outer or printing face of the type.

With these structures, the inking operation is automatic, no separate inking operation is necessary and the mere depression of the operating bar causes a sufficient inking of any one of the types to which it has been applied. It is only necessary to maintain a supply of the ink or printing fluid in the chamber in or at the back of the type carrying disc. It is preferable that the amount of ink fed at each movement of the operating bar is sufficient for one impression of the type only and to repeat the impression of each type, it is only necessary to raise the operating bar from its engagement of the top depressible wall and then to repeat its application for another printing impression. While this printing or inking structure is particularly adapted for use in connection with hand operable and depressible printing apparatus for printing individual cards, placards, and the like, the invention is not to be understood as restricted to this type of printing mechanism or to the exact detail set forth since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described the invention which we claim as new and desire to secure by Letters Patent is:

1. In a card printing apparatus, the combination with a resilient type carrier having a plurality of types and selectively movable to bring any type to a printing position, a liquid ink chamber at the back of the type, the type being pervious to the passage of inking liquid therethrough, and means for compressing the carrier and forcing liquid from the chamber through the type and also moving the type for printing.

2. In printing apparatus, a resilient type carrier movable to place any one of a plurality of types in a printing position, a liquid ink chamber at the back of the types, the types being pervious to the passage of inking liquid therethrough, and means to resiliently deflect the carrier and press any type from the carrier at the printing position into printing engagement and at the same time to apply the ink which passes through the type to a surface to be printed.

3. In card printing apparatus, a resilient type carrier movable to place any one of a plurality of types in a printing position, a chamber for holding ink in contact with the backs of the types, the types being pervious to the passage of ink therethrough, and means to deflect the resilient carrier and apply pressure to ink at the back of any type at the printing position and thereby to force ink therethrough to the printing face of the type for printing.

4. In printing apparatus, the combination with a type carrier selectively movable to bring any type to a printing position, a plurality of types mounted on the carrier, each pervious to the passage of inking material from the back to the printing face thereof, an ink chamber at the back of the type, and means at the printing position to deflect the carrier for compressing ink from the chamber through the type to the printing

face thereof and thus moving the carrier in applying the type for printing.

5. In printing apparatus, a type carrier movable to place any one of a plurality of types in a printing position, the carrier comprising a hollow resilient member for containing a printing liquid, a plurality of types pervious to the passage of inking liquid therethrough, secured to the outer face of the member and communicating at the back of the type with the chamber, and means for engaging the side of the member opposite a type at the printing position for compressing the adjacent wall of the member pressing ink against the rear of the selected type thereby distorting the member and applying the face of the type to the surface to be printed.

6. In printing apparatus, a type carrier selectively movable to place any one of a plurality of types in a printing position, the type carrier including a resilient hollow member with communicating chambers corresponding to each of the types, a liquid printing ink contained in the hollow member, a plurality of pervious types secured to one outer face of the member and each communicating with a corresponding chamber of said member, and means for engaging the wall of the member opposite a selected type at the printing point for compressing ink in that chamber corresponding to the type thereby distorting the member and forcing it against the back of the type at the printing point.

7. In printing apparatus, a type carrier comprising a hollow resilient member, a plurality of chambers separated by partitions with restricted passages therethrough and inking material contained in the chambers of the resilient member, a plurality of types each secured to the outer side of the member and the back of the type communicating with the inking chamber corresponding thereto and pervious to the passage of inking material from the back to the printing face of the type, and means for applying pressure at the side of the member opposite any one of the printing types for compressing the chamber corresponding to that type, forcing the liquid from the chamber against the back of the type and distorting the resilient member for applying the type to the surface to be printed.

8. In printing apparatus, a type carrier comprising a hollow resilient member having a plurality of chambers separated by partitions with restricted passages therethrough from chamber to chamber, a supporting plate with ribs corresponding to the partitions of the plurality of types secured at one side of the member which is supported by the plate and located between the ribs, a printing ink contained in the chambers, the types being pervious to the passage of printing ink from the back to the printing face of each type, means forming connection between the inking chamber and the back of each type through the one wall of the member and means for engaging the other wall of the member to compress ink in the chamber to apply it against the back of the type and to press the opposite wall of the member and the type out of its normal plane as determined by the plate and to apply the face of the type to the surface to be printed.

9. In printing apparatus of the character described, a type carrier comprising a hollow resilient member with chambers separated by partitions with restricted communicating openings therebetween, a type secured to the outer face of one wall of the member and pervious to the passage of printing ink from one of the chambers to the printing face of the type, means comprising a plate within the chamber and having passages communicating with the back of the type of that chamber, and means for compressing the wall of the chamber opposite the type and engaging the plate and conpressing it with the wall supporting the type into printing engagement of the type with the surface to be printed.

10. In printing apparatus, a type carrier comprising a hollow resilient member with partitions having restricted openings thereto forming a plurality of inking chambers, a supporting plate having ribs corresponding to the partitions for supporting the member on one face thereof, a plurality of types secured to the outer face of the member supported by the plate and composed of material pervious to the passage of printing ink therethrough, communicating passages through the wall of the member to the back of the type supported thereby, a plate within the member having grooves at the under face to form communication with the passage ways through the wall of the member to the back of the type, and means for compressing the opposite wall of the member engaging the plate and forcing the type supporting wall and the type relatively to the plate for applying the face of the type to the surface to be printed.

11. In printing apparatus, a type carrier comprising a hollow resilient member with partitions forming chambers and with restricted passages through the partitions connecting the chambers, a plurality of types secured to one outer face of the member and having means comprising a recess at the back of the type and passage ways through the wall of the member forming communication from the recess to the chamber corresponding to that type, inking liquid in the chamber and recess, the type having openings extending from the back to the printing face thereof for the passage of printing liquid, and means for engaging the wall of the member opposite that to which the type is secured for compressing the chamber corresponding to the type, forcing ink through the passage way of the opposite wall into the recess at the back of the type and compressing ink in the recess and forcing it through the openings in the type to the printing face thereof.

12. In printing apparatus, a type carrier comprising a hollow resilient member having a plurality of chambers with partitions having restricted passages between the chambers, a supporting plate having ribs corresponding to the partitions of the member, a plurality of types secured to the outer face of the member supported by the plate, the types being separated by the ribs thereof, each type having a recess at the back and a plurality of restricted passages from the back of the type to the printing face thereof communicating with said recess, an opening through the wall of the member communicating with the recess, liquid printing ink in the chamber and recess, a printing contact plate secured to the outer wall of the member opposite the type, and means for engaging the plate to compress the adjacent wall into the chamber to close the opening in the opposite wall and to compress ink in the recess, deflecting the walls of the member with respect to the supporting plate and forcing printing ink through the passages of the type to the printing face thereof.

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