April 20, 1937. I. HAKOGI 2,077,790

METHOD OF AND APPARATUS FOR PRINTING ON CURVED FACED BODIES

Filed April 27, 1935

Fig. 1.

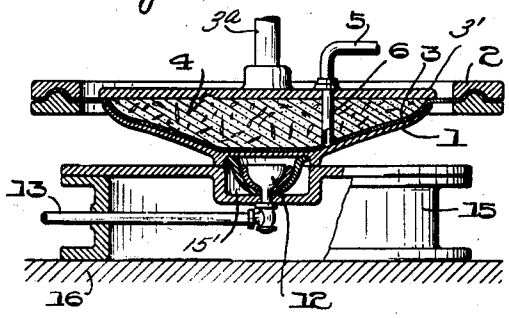


Fig. 2.

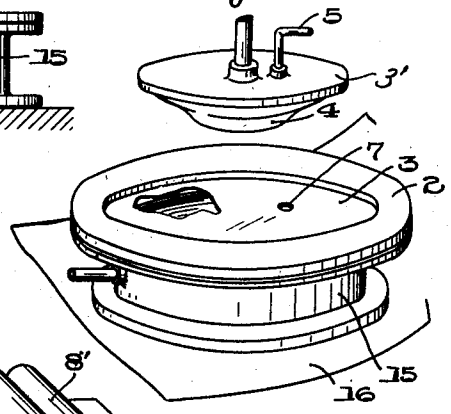


Fig. 3.

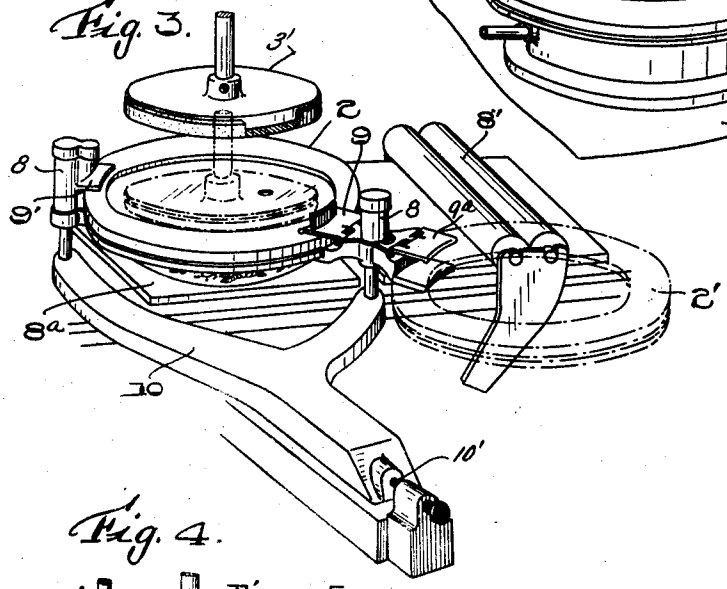
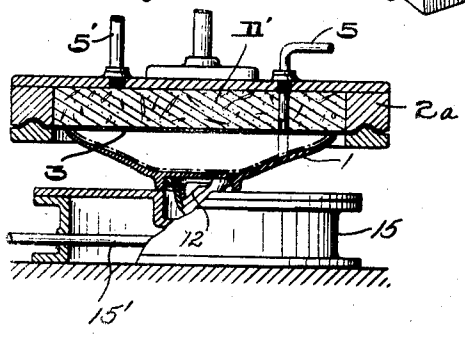


Fig. 4.



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METHOD OF AND APPARATUS FOR PRINTING ON CURVED FACED BODIES

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9 Claims. (Cl. 101—35)

This invention relates to offset printing apparatus and has special reference to a printing apparatus for offset printing on hollow articles such as bowls or the like.

In printing of this character it is usual to employ a flexible blanket but much trouble is experienced in causing such a blanket to fit closely to all parts of the bowl or other article on which the impression is to be made.

One object of the present invention is to provide an improved form of offset printing apparatus wherein a close fit between the surface of the article receiving the printing and the blanket will be obtained.

A second important object of the invention is to provide novel means whereby the pressure of the blanket against the article receiving the impression is uniform throughout.

A third important object of the invention is to provide a novel construction for this purpose wherein the article itself will be held firmly in position during reception of the impression.

A fourth important object of the invention is to provide a novel construction of such a device whereby all air-pockets or layers are removed from between the blanket and the article whereon the impression is to be made.

With the above and other objects in view as will be hereinafter apparent, the invention consists in general of certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawing and specifically claimed.

In the accompanying drawing like characters of reference indicate like parts in the several views, and:

Fig. 1 is a cross-section through the improved device showing an article in position to receive the impression.

Fig. 2 is a perspective view of certain details of the invention showing the manner in which pressure is applied.

Fig. 3 is a semi-diagrammatic perspective view showing a form of apparatus designed to transfer the original impression to the blanket.

Fig. 4 is a sectional view similar to Fig. 1 but showing a modification thereof.

In the form of the device as shown in Figs. 1, 2 and 3 it will be seen that the article upon which the printing impression is to be made is illustrated at 1. A clamping ring 2 of sufficient size to surround this article supports a blanket 3 which is preferably made of rubber. The pressing device consists of a plate 3' actuated by a plunger 3a which is reciprocating by a suitable mechanism in a vertical direction. On the underside of the plate 3' there is provided a cushion 4 which is preferably of sponge rubber and the lower surface of which conforms, at least roughly, to the interior of the bowl 1. Connected with the plate 1 is a suction pipe 5 of extensible and flexible material which leads to any suitable means for producing a partial vacuum and this pipe 5 extends downwardly through the cushion 4 as at 6. The blanket 3 is provided with an opening 7 which registers with the lower end of the pipe 5 upon the pressing device being depressed so that when the pressing device is depressed on the blanket and the latter is forced into the article 1 a partial vacuum will be produced removing the air from between the blanket and the article 1 and thus causing the blanket to fit closely throughout its printing extent into the article. In order to hold the article in position there is also provided a base 15 resting on a suitable support 16 and at the center of this base there is provided a pocket 15' wherein is located a suction cup 12 which engages at its upper edge beneath the center of the article or bowl 1, and thus holds the said article or bowl firmly on top of the base 15. This suction is connected by a pipe 13 to a suitable vacuum producing device, not shown.

As shown in Fig. 3 the ring 2 is supported by clips 9 and 9' which are held by pneumatic cylinders 8, the ring 2 being revoluble on the axis of one cylinder 8 so that the clip 9 is fixed to the ring 2 during the operation while the ring can slip in and out of the clip 9' as it revolves about the axis of the cylinder 8. Also the same cylinder that carries the clip 9 carries a clip 9a which supports an auxiliary ring 2' swinging into and out of printing position over a longitudinally movable inking platen 8a which travels beneath inking rollers 8'. The ring 2' and ring 2 are thus interchangeable in position. The cylinders 8 are supported on a rocking frame 10 suitably mounted as at 10' to allow the blanket, when the platen 8a is at the left in Fig. 3, to be depressed and inked with the design to be impressed on the bowl or article 1.

In the form shown in Fig. 4 the ring 2 is replaced by a ring 2a and the blanket 3 is illustrated as extending in a plane across the ring but when the air is exhausted below the sponge rubber member 11' the blanket will fit into the bowl or article 1 as shown in dotted lines in that figure. At the same time air may be introduced at 5' from a compressed air tank to produce pressure

on top of the sponge rubber 11' and thus insure a closer fitting.

From the foregoing it will be seen that since the air is evacuated from beneath the blanket 3 the latter is caused to fit closely on the interior of the bowl or article 1 no matter what its shape, and in the form shown in Fig. 4 this is additionally aided by air pressure from above the sponge rubber member or cushion.

In operation after the impression from the transfer plate or platen 8a has been received on the underside of the blanket the transfer plate is moved to the right of Fig. 3 to pass beneath the inking rollers 8' and the bowl or other article, as indicated at 1, is placed in position and there held by the suction cup 12. Then, through suitable manipulation of the pressing device 3' the blanket is forced downwardly and the suction through the pipe 5 draws the air out from between the blanket and bowl or article and causes the blanket to fit throughout on the article thus giving a uniform impression, this being assisted by the action of the sponge rubber cushion 4 as in Fig. 1 and 11' as in Fig. 4.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

It is obvious that minor changes may be made in the form and construction of the invention without departing from the material spirit thereof. It is not, therefore, desired to confine the invention to the exact form herein shown and described, but it is desired to include all such as properly come within the scope claimed.

I claim:

1. In a device for the purpose described, a supporting ring, a flexible and elastic blanket carried by said ring, a presser member vertically reciprocable above said blanket and having a highly elastic cushion adapted to engage and depress said blanket, and a suction pipe extending downwardly through said presser member, said blanket having an opening therein registering with the lower end of said pipe upon depression of the presser member.

2. In a device for the purpose described, a supporting ring, a flexible and elastic blanket carried by said ring, a presser member vertically reciprocable above said blanket and having a highly elastic cushion adapted to engage and depress said blanket, a suction pipe extending downwardly through said presser member, said blanket having an opening therein registering with the lower end of said pipe upon depression of the presser member, and a pressure pipe opening into the presser member above said highly elastic cushion.

3. In a device for the purpose described, a supporting ring, a flexible and elastic blanket carried by said ring, a presser member vertically reciprocable above said blanket and having a highly elastic cushion adapted to engage and depress said blanket, a suction pipe extending downwardly through said presser member, said blanket having an opening therein registering with the lower end of said pipe upon depression of the presser member, and means to firmly support an article concentrically below said ring.

4. In a device for the purpose described, a supporting ring, a flexible and elastic blanket carried by said ring, a presser member vertically reciprocable above said blanket and having a highly elastic cushion adapted to engage and depress said blanket, a suction pipe extending downwardly through said presser member, said blanket having an opening therein registering with the lower end of said pipe upon depression of the presser member, a pressure pipe opening into the presser member above said highly elastic cushion, and means to firmly support an article concentrically below said ring.

5. In a device for the purpose described, a supporting ring, a flexible and elastic blanket carried by said ring, a presser member vertically reciprocable above said blanket and having a highly elastic cushion adapted to engage and depress said blanket, a suction pipe extending downwardly through said presser member, said blanket having an opening therein registering with the lower end of said pipe upon depression of the presser member, an article support mounted concentrically below said ring, and a vacuum cup carried by said support and engageable with an article on the support to hold the same firmly thereto.

6. In a device for the purpose described, a supporting ring, a flexible and elastic blanket carried by said ring, a presser member vertically reciprocable above said blanket and having a highly elastic cushion adapted to engage and depress said blanket, a suction pipe extending downwardly through said presser member, said blanket having an opening therein registering with the lower end of said pipe upon depression of the presser member, a pressure pipe opening into the presser member above said highly elastic cushion, an article support mounted concentrically below said ring, and a vacuum pump carried by said support and engageable with an article on the support to hold the same firmly thereto.

7. That method of offset printing upon curved faced bodies which consists in stretching an elastic offset blanket above the body, producing pressure on the upper side of said blanket by an elastic medium, and exhausting the air from between the object and blanket.

8. That method of offset printing upon curved faced bodies which consists in stretching an elastic offset blanket adjacent the body to extend across the same, exerting air pressure on the side of the blanket remote from the body, and permitting free escape of air from between the blanket and body.

9. The method of offset printing upon hollow curved faced bodies which consists in placing an elastic offset blanket above the body to receive the printing and in contact with the rim thereof, thereby forming a tightly closed air space between the surface of the body and the offset blanket, evacuating the air from said air space and thereby bringing the offset blanket into close contact with the surface to receive the printing.

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