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FLEXIBLE PRINTING PLATE ASSEMBLY

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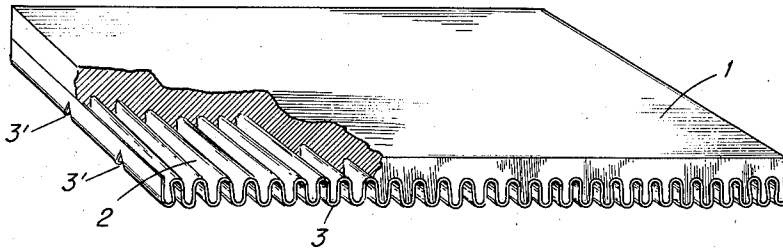


FIG. 1

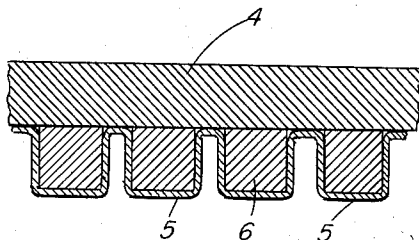


FIG. 2

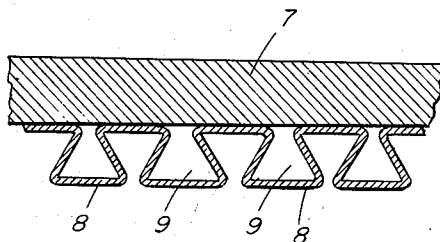


FIG. 3

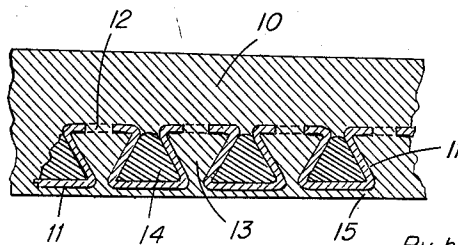


FIG. 4

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FLEXIBLE PRINTING PLATE ASSEMBLY

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10 Claims. (Cl. 101—395)

The invention relates to flexible printing plate assemblies, which on the rear side are provided with a flexible layer of magnetizable material, by means of which the printing plate is secured to a magnetic printing cylinder or other magnetic printing base in a printing machine.

A number of arrangements of such flexible printing plates are previously known, which plates contain magnetizable material, and are arranged in such a way that the printing plate is solidly secured to a magnetic cylinder. Thus it is known from the applicant's Norwegian Patent No. 88,085 to secure a layer of rods or bars of magnetizable material placed beside each other, to the back of flexible printing plates, these rods being placed close to each other so that they form a continuous magnetic layer, which, however, permits the printing plate to bend so much that it can be placed around a printing cylinder provided with magnetic means.

From the applicant's Norwegian Patent No. 89,039 it is further known to provide such flexible printing plates with a layer of magnetizable material in the form of short bar elements, placed beside each other in overlapping position. From the same patent it is also known to form a plate of, for instance, iron, with such aperture, incision or the like that a flexible arrangement is provided which can be secured to the back of the printing plate.

The present invention refers to further improvements in the above mentioned means, the intention of which is by simple means to obtain secure attachment between the printing plate and the magnetizable layer, as well as secure adherence of the assembled printing unit to the magnetic cylinder.

According to the invention the above is achieved by securing a corrugated plate to or into the printing plate assembly, which plate is alternately bent, for instance in zig-zag or after a wave-line. This plate should be made of magnetizable material, and magnetizable material, for instance in the form of bars can be placed in the bends of the plate, for instance in every other bend, to strengthen the magnetic adherence.

The plate according to the invention can be solid, or can be provided with incisions, perforations, apertures or the like to obtain better adherence to the back of the printing plate, for instance by being suitably moulded into the latter.

The above as well as further features of the invention will appear clearly from the following description of some examples illustrated in the drawing.

Fig. 1 is a perspective view of a printing plate arrangement according to the invention, one corner being partly cut off to show the construction of the arrangement.

Fig. 2 shows on a larger scale a cross section through part of a printing plate, arranged according to a modification of the invention.

Figs. 3 and 4 show further modifications of the invention.

The printing plate arrangement shown in Fig. 1 consists of a printing plate 1 of ordinary flexible material. A corrugated iron plate 2 is secured to the printing plate

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1. One side of this can be secured to the printing plate 1 by suitable means as for instance glue, or an intermediate layer, for instance of thermosetting flexible material, can be arranged in the connection between these parts 1 and 2. The plate 2 can also be vulcanized to the printing plate 1, whereby the material of this plate 1 preferably will penetrate down between the grooves 3. If necessary the downwardly facing ridges 3 can be provided with suitably spaced incisions 3', whereby the printing plate gets a certain flexibility also in the direction transverse the ridges and grooves. This can be of importance to facilitate alignment of the printing plate on the pressure plate.

The arrangement according to Fig. 2 requires a printing plate 4, to which is secured a plate 5, provided with rectangular closely spaced ridges and grooves. Bar shaped elements 6 of for instance iron are then placed in each of the upward facing grooves. The elements 6 as well as the remaining parts of the plate 5 are then secured to the printing plate by suitable means as described in connection with Fig. 1.

Fig. 3 shows a further modification in cross section. Here the printing plate 7 is provided with a plate 8 bent into triangles. This bending provides a large contact surface against the printing plate 7, as well as against the magnetic cylinder, around the circumference of which the printing plate is to be adapted. If the plate 8 is made of for instance iron, it can give sufficient adherence according to the arrangement as shown in Fig. 1. If desired this adherence can, however, be strengthened by placing for instance iron rods in the upward facing grooves 9. Iron powder can also be used, but the ends of the upward facing grooves will then have to be closed.

In Fig. 4 is shown a somewhat modified arrangement of the plate according to Fig. 3. In Fig. 4 this is bent as shown at 11 and the upward facing ridges are provided with apertures 12, at the same time as iron rods have been placed in the upward facing grooves. In this example the plate 11 and rods 14 are secured to the printing plate by being embedded or moulded into the material 10 itself of the printing plate. The apertures 12 in the plate 11 then contribute to facilitate the penetration of the material of the printing plate into the spaces 13 constituted by the downwardly facing grooves to secure the attachment between the two parts of the printing plate assembly. The element 11 could also be formed of bent iron wire cloth of single threads. Instead of being moulded into the material itself of the printing plate, the plate 11 can be moulded into a layer of the same or other material than the printing plate, and this layer then suitably secured to the printing plate.

To provide good contact with the printing cylinder or printing base the contact surface of the plate can be coated by a film of flexible friction inducing material. As indicated in Fig. 4 this layer can be provided by embedding i.e. burying the magnetic elements into the printing plate in such a way that a thin outer layer 15 remains on the lower side of the plate 11.

In those cases where the upward facing grooves of the plate contain elements of magnetizable character, as for instance iron rods 6 or 14, the bent plate itself does not necessarily have to consist of magnetizable material, even if this ordinarily would be an advantage from the point of view of magnetic effect. For effective attachment and/or embedding the plate can, however, in certain cases with advantage be made of non-magnetizable material, but then obviously will have to encompass elements of magnetizable material.

It will further be understood that the examples described above and shown in the drawing are only meant to illustrate the inventive idea and that this may be varied in several ways within the scope of the invention. Thus

the plate can be bent into several other shapes. Likewise the plate can be provided with apertures, perforations, cut off parts etc., according to what has proven suitable for secure joining with the printing plate as well as favourable flexibility of the assembled printing arrangement. Likewise the plate can be provided with parts bent up or in, flaps or one plan and one bent plate, which are joined together for suitable attachment of inserted elements of magnetizable material etc. in the upward facing grooves of the plate.

It will further be understood that the plate which is secured to the printing plate or to an intermediate layer does not necessarily have to be made of metal. Thus a plate of other suitable flexible material can also be used. Such a plate has the advantage of being easier to join with the printing plate or the intermediate layer, for instance by vulcanizing.

It will further be understood that the elements of magnetizable material which are inserted in the upward facing grooves of the plate, instead of rods of magnetizable material can be made of casting mass or powder of magnetizable material. Such material can also according to a modification be moulded directly into the channel formed upward facing grooves of the plate. Further instead of only one bent plate, which is secured to the printing plate or an intermediate layer, a plate which is assembled of two or more thinner plates, or possibly a number of very thin foils of magnetizable material can be used. Such an assembled plate has greater flexibility than one single plate of the same thickness as the assembled plate.

I claims:

1. A flexible printing plate assembly adapted to be attached to a base such as a printing machine printing cylinder provided with a magnetic device, said plate assembly having a layer of magnetizable material for securing the plate assembly to the base, said layer comprising a flexible corrugated magnetizable plate with the ridges and grooves disposed transversely of the width of the plate assembly, said magnetizable plate being located below the printing surface of the plate assembly and within the field of the magnetic device adapted to secure solid magnetic adherence of the plate assembly to the base.

2. A flexible printing plate assembly adapted to be attached to a base such as a printing machine printing cylinder provided with a magnetic device, said assembly having a layer of magnetizable material for securing the plate assembly to the base, said layer comprising a flexible corrugated magnetizable plate with the ridges and grooves disposed transversely of the width of the printing plate, the ridges forming the surface of the plate adapted to come in magnetic contact with said magnetic device.

3. A flexible printing plate assembly according to claim 2 in which the downwardly facing ridges are provided with incisions suitably spaced along their length to impart some flexibility to the plate assembly transverse to the bends.

4. A flexible printing plate assembly according to claim 2 in which there are bar elements of magnetizable material inserted in upwardly facing grooves of the plate, to impart increased magnetic effect between the base and the plate assembly.

5. A flexible printing plate assembly according to claim 1 wherein the corrugated plate is embedded in the material itself of the plate assembly.

6. A flexible printing plate assembly according to claim 1 wherein the upward facing ridges of the corrugated plate are provided with apertures suitably spaced along their length to assure the firm union of the parts by facilitating flow of the material around the upward facing area of the corrugated plate.

7. A flexible printing plate assembly adapted to be attached to a base such as a printing press printing cylinder provided with a magnetic device, such assembly comprising a printing plate, a flexible, corrugated non-metallic plate secured thereto by vulcanization, there being magnetizable material in the upwardly facing grooves of the corrugated plate to provide magnetic paths for the field of the magnetic device.

8. A flexible printing plate assembly according to claim 7 wherein the upward facing ridges of the flexible, corrugated plate are provided with apertures to assure the firm union of the parts by facilitating flow of the material around the upward facing area of the corrugated plate.

9. A flexible printing plate assembly according to claim 2 wherein the corrugated plate is a bent iron wire cloth of single threads.

10. A flexible printing plate assembly according to claim 2 wherein the downward facing ridges of the corrugated plate are coated with a film of flexible, friction-inducing material.

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