Sept. 23, 1969 B. L. WATERHOUSE ETAL 3,468,253

PRINTING PLATE ASSEMBLY

Filed Jan. 9, 1967

Fig. 1.

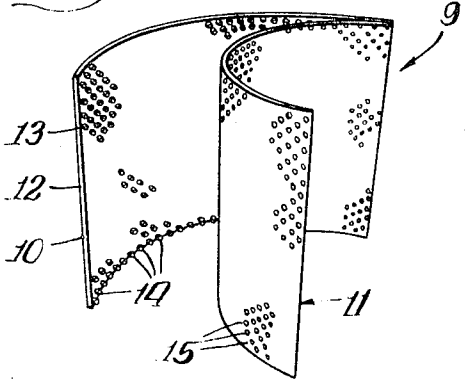


Fig. 2.

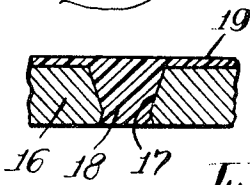


Fig. 3.

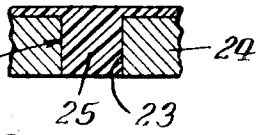


Fig. 4.

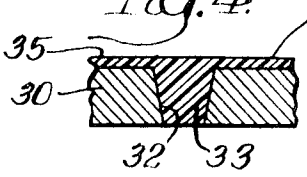


Fig. 5.

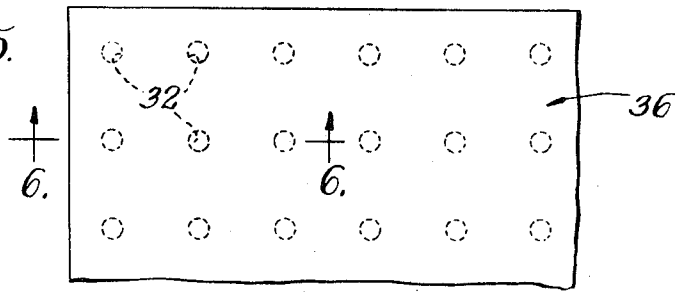


Fig. 6.

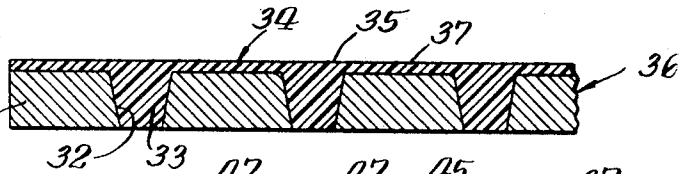


Fig. 7.

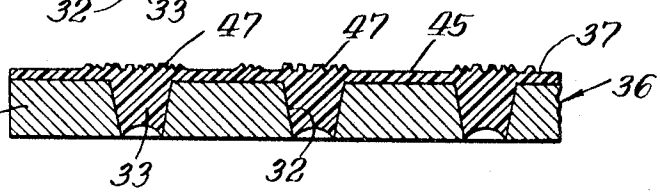
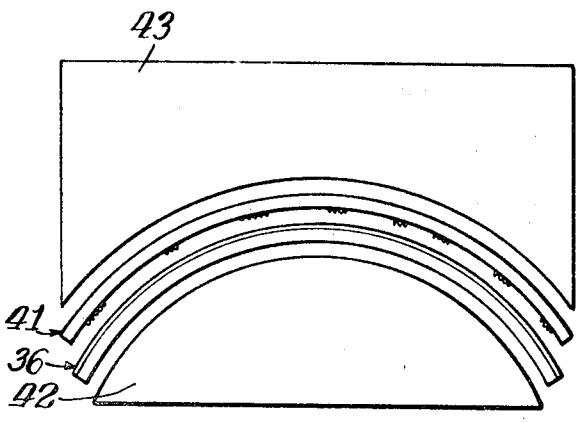


Fig. 8.



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PRINTING PLATE ASSEMBLY

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U.S. Cl. 101—395 6 Claims

ABSTRACT OF THE DISCLOSURE

A printing plate assembly defined by a rigid perforated saddle component and a body component of thermoplastic material having preformed integral projections fitting into the perforations of the saddle component for attaching the body component to the saddle component.

The present invention relates to a printing plate assembly having utility for making a printing plate and mounting the same on printing apparatus.

It has been the practice for many years in stereotype printing to provide a printing plate by casting molten lead into a matrix. The resulting plate is heavy and the press for using such plates must be of rugged and strong construction to run such plates and provide for any substantial production of printed material. Additionally, to reuse the lead for subsequent plates requires expensive equipment and the methods employed with such equipment are slow and cumbersome.

In view of the foregoing, the art has experimented with other materials for fabricating printing plates such as by using plastic compositions, both thermoplastic and thermosetting. Such practices in the art have not been fully practical due, in some instances, to the inability of using the plastic compositions for making a plurality of successive and different useful printing plates, and in other cases of inconvenience in maintaining dimensional stability of the plates for effecting satisfactory registration of printed material.

In order to overcome some of the last noted objections it is known to provide a plastic printing plate by providing a preform component from which a printing plate may be made embodying a mesh reinforcing component embedded in the body component of thermoplastic material and in which the mesh reinforcing component is intended to impart stability in the lengthwise and crosswise directions of the preform, and also serve as a reservoir means for displacement of the thermoplastic material in forming a printing surface.

The approach last noted is somewhat unsatisfactory from a practical standpoint in that the crossing wires of the wire mesh reinforcing may readily shift with respect to each other from their desired lengthwise and crosswise positions altering the desired configuration of a printing plate to be formed from the assembly, and displace relative to the plastic body component unless meticulous care and attention is paid in forming the preform component into a printing plate. Further in the preform component noted a separate saddle or carrier member is required to mount the formed printing plate or printing apparatus.

It is the purpose of the present invention to overcome the aforementioned and other disadvantages of known plastic printing plates by providing a printing plate assembly comprising a rigid saddle component and a body component of thermoplastic material, and in which the saddle component has a plurality of perforations for receiving integral projections extending from a planar portion of the thermoplastic body component so that the rigid saddle component provides for the mounting of the

assembly in a printing apparatus, and with the perforations in the saddle component serving as reservoir means for displacement of the material of the projections in the formation of a printing surface on the planar portion of the body component.

The saddle component as aforementioned is rigid and imparts fixed lengthwise and transverse stability to the assembly and may be formed flat or curved for utilization in flat bed or rotary printing apparatus, and in this respect is of considerable advantage and utility over the aforementioned wire mesh reinforced preform component. The body component may conveniently comprise any suitable thermoplastic material such as low density polyethylene, polypropylene, polystyrene, polyvinyl chloride, ethylene, mixtures thereof or like equivalent plastic materials. The aforementioned projections of the body component fit into the perforations of the saddle with the perforations in the saddle serving as reservoir means for the displacement of the material of the projections relative to such perforations in the forming of printing characters on an outer surface of the planar portion of the body component.

A preferred feature of the invention resides in providing at least some of the perforations in the saddle and projections on the body component of formations to provide a snap or inter-locking fit therebetween to firmly secure the body component to the saddle member.

With an assembly as aforenoted, a printing plate may be readily fabricated by providing a saddle component, of either flat or curved configuration, and with which the body component of thermoplastic material is assembled therewith. The assembly thus formed may be positioned with the body component in superposed relation with respect to a matrix for the desired printing plate and between the platens of a press, and then displacing the plastic component by relative movement of the material of the projections with respect to the perforations of a saddle member into the indentations of the matrix. In the completed printing plate, the saddle component provides a rigid member for mounting of the plate on a printing apparatus and assures good registration of the printing indicia formed on the plastic body component.

The above and other objects and advantages of the invention will appear from the following detailed description of preferred embodiments of the invention.

In the drawings:

FIGURE 1 is a perspective view of a printing plate assembly of the present invention with the saddle component and plastic body component body thereof in spaced apart relation to show perforations of the saddle component and the projections of the body component fitting into the perforations of the saddle component;

FIGURE 2 is a detail cross sectional view through one perforation of a saddle component and one of the projections of a body component fitting into the perforation of the saddle component;

FIGURE 3 is a detail cross sectional view showing another form of configuration of perforation for a saddle component and a projection of a body component therefor;

FIGURE 4 is a detail cross sectional view showing still another configuration of a perforation for a saddle component and a projection of a body component therefor;

FIGURE 5 is a plan view of a portion of a printing plate assembly of the present invention;

FIGURE 6 is a detail vertical cross sectional view taken along the line 6—6 of FIGURE 5 looking in the direction indicated by the arrows;

FIGURE 7 is a cross sectional view of a printing plate formed from the printing plate assembly of FIGURE 6; and

FIGURE 8 is a diagrammatic view illustrating the manner in which the printing plate assembly of the present invention is formed into a printing plate.

Referring now to FIGURE 1, the printing plate assembly **9** of the present invention comprises a plastic body component indicated at **10**, which may be composed of any suitable or desirable thermoplastic material, such as low density polyethylene, or other types thereof, and further may comprise polypropylene, polystyrene, polyvinyl chloride, ethylene, mixtures thereof or like equivalent plastic compositions. The printing plate assembly **9** further comprises a saddle component as indicated generally at **11**. The saddle component **11** is preferably fabricated of a rigid and substantially inextensible material such as metal or plastic to provide a dimensionally stable printing assembly. Light weight metal, such as aluminum serves admirably well for the saddle component. The saddle component **11** may be of flat planar configuration for use in flat bed printing or may be of substantially semicylindrical form as shown in FIGURE 1, for mounting on the rotating drum of a rotary printing press.

The plastic body component **10** is defined by a planar portion **12** having an outer surface **13** which is to be formed into a printing surface and from which planar portion **12** a plurality of integral preformed projections, indicated at **14**, extend away from the outer surface of the planar portion. The saddle component **11** is formed with a plurality of preformed perforations, as at **15**, each of a shape and configuration to receive one each of the projections **14** for mounting the body component on the saddle component of the printing plate assembly.

The cross-sectional configurations of the perforations **15** and projections **14** may vary widely to provide, as will be described below, for at least certain of them serving to secure the plastic body component **10** to the saddle member **11**, and in which the same or other of the perforations **15** define reservoir means for the relative displacement therein of portions of the projections **14** and of the thermoplastic body component **10** in defining printing indicia at the outer surface **13** of the planar portion **12** of the body component.

In FIGURE 2 there is shown a portion of a saddle component **16** and a perforation **17** thereof and together with a projection **18** of a plastic body component member **19** in which the perforation **17** and the projection **18** each have matched portions of different transverse dimensions in which the projections **18** and the perforations **17** of the saddle member **16** provide for attaching the body component to the saddle component by pressing or snapping the projections **18** into the perforations **17**. The transverse configurations of the perforation **17** and the projection **18** in the illustrated embodiment engage in an interlocking relationship upon forcing of the displaceable free ends of the projections **18** through the perforations **17** in the saddle member **16**.

Referring now to FIGURE 3 there is shown a modified form of perforation **23** of a saddle component **24** and a projection **25** of a body component **26** therefor in which the perforation **23** and the projection **25** are substantially circular in cross-section with the projection being preferably slightly larger than the perforation to provide a tight friction fit between the projection and wall of the perforation.

Turning now to FIGURE 4 there is shown a portion of still another saddle member **30** formed with a tapered perforation **32** into which a correspondingly tapered projection **33** of the body component **34** extends. The projection **33** and perforation **32** taper in a direction so that the ends of smaller dimension lie away from the planar portion **35** of the body component **34**.

It will be readily understood that many configurations in addition to those above described may be provided for the perforations in the saddle component and the projections of the plastic body component, and such perforations and projections may provide for interlocking of the components with each other or for a friction fit between the projections and perforations. Any number of perforations and projections may be provided to secure the plastic body component to the saddle component and these same perforations and/or other perforations of the saddle component serve as reservoir means for the projections of the body component so that the material of a projection may be displaced relative to the perforation in the saddle component to provide printing indicia at the outer surface of the planar portion of a plastic body component as will be below described.

Upon reference now to FIGURES 5 and 6, there is shown a printing plate assembly **36** embodying the body component **34** and saddle component **30** as last described in connection with FIGURE 4. As previously indicated, at least some or all of the projections **33** of the body component and the perforations **32** of the saddle member therefore may provide for the mounting of the body component **34** on the saddle component **30**, and certain or all of the perforations **32** as may be desired, define reservoir means for the material or projections **33** of the body component so that the material of the projections may displace relative to the perforations **32** in the formation of printing indicia at the outer surface **37** of the planar portion **35** of the body component **34**.

In forming a printing plate, such as shown in FIGURE 7, from the above described saddle member and plastic body component, the printing plate assembly **36** may be positioned, as shown in FIGURE 8, between any suitable and conventional matrix **41** and a lower platen **42** of a configuration conforming to that of the printing plate assembly **36**. An upper platen **43** having a surface conforming to that of the planar portion **35** of the printing plate assembly **36** is disposed above the matrix. Thereafter the lower and upper platens **42** and **43** are brought together. Air between the printing plate assembly **36** and the matrix **41** may be removed by vacuum and heat and slight pressure may be applied to effect softening of the plastic body component so that the outer surface of the planar portion **37** of the body component **34** is displaced into the recesses of the matrix **41** to provide printing indicia as at **47**. Alternatively, the body component may be heated to render it displaceable into the recesses of the matrix by pressure applied by the platens.

As diagrammatically illustrated in FIGURE 7, it will be seen that the material of the projections **33** of the body component **34** have been displaced to provide the printing indicia indicated generally at **47**. The saddle component **30** is rigid and in forming of the printing indicia at the outer surface of the planar portion of the body component, voids are formed at the base of the saddle component corresponding to the extent that the plastic material of the projections and of the body component have been displaced in forming the printing indicia of the printing plate. Thus, the perforations **32** serve as reservoir means providing for the relative movement of the material of the body component in forming the printing plate. The saddle member **30** since it is rigid and dimensionally stable remains stationary and the material of the body component moves relative to the saddle component.

If desired and to facilitate formation of printing indicia on the plastic body component the latter may be preheated before it is positioned between the platens **42** and **43**.

The invention claimed is:

1. A printing plate assembly comprising a rigid saddle component formed with a plurality of preformed perforations extending between inner and outer surfaces thereof, and a body component of thermoplastic material, said body component being defined by a planar portion having an outer surface and a plurality of integral preformed projections extending away from said planar portion, said projections of said body component being disposed in the perforations of said saddle component and with

said planar portion supported on said outer surface of said saddle component, and at least some of said perforations of said saddle component serving as reservoir means for said projections of said body component in said last named perforations for displacement of the material thereof relative to said last named perforations in the formation of a printing surface on said outer surface of said planar portion of said body component.

2. The printing plate assembly of claim 1 characterized by certain of said perforations and said projections thereof being formed to provide for attaching said body component to said saddle component by pressing said projections of said body component into the perforations of said saddle component.

3. The printing plate assembly of claim 1 characterized by at least certain of said perforations of said saddle component having transverse cross sectional portions thereof of different dimensions, and said projections in said last named perforations being of configurations corresponding to the configurations of said last named perforations.

4. A printing plate assembly comprising a rigid saddle component formed with a plurality of preformed perforations extending between inner and outer surfaces thereof, and a body component of thermoplastic material disposed in superposed relation with respect to said saddle component, printing indicia at the outer surface of said body component, said body component comprising a plurality of preformed projections extending from said body component in a direction away from said outer surface, said

projections of said body component being disposed in the perforations of said saddle component, and at least some of said projections having portions thereof displaced relative to said perforations of said body component for forming said printing indicia.

5. A printing plate assembly of claim 4 characterized by certain of said perforations and said projections thereof being formed to provide for attaching said body component to said saddle component by pressing said last named projections of said body component into said last named perforations of said saddle component.

6. The printing plate of claim 4 characterized by at least certain of said perforations of said saddle component having transverse cross sectional portions thereof of different dimensions, and said projections in said last named perforations having transverse cross-sectional portions corresponding at least in part to the cross-sectional portions of said last named perforations to secure said body component to said saddle component.

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