

Description

The invention relates to a screen for printing, or the like, comprising a screen skeleton in the form of a fine mesh and a further layer of metal electrolytically deposited upon the screen skeleton.

Such screen materials are known from DE—B—1 141 295 and WO 80/00677. In said publications is described a process for variably closing the openings in a wire-gauze material, for instance by electrode-position of metal.

Such a known material has as a drawback that the material still essentially has a gauze character which may lead to a reduced sharpness of the edges of a pattern printed with such a material which shows up in the form of a saw-teeth profile of said edges.

In general for printings for which great detail fineness and detail sharpness are desirable, screen material is known to be used in the form of a woven polyester gauze, said polyester gauze meeting the requirements of the fineness desired.

Said known screen material presents the drawback that at all times it has to be kept in store under tension mounted on frames. This requires large storage facilities, since a particular screen material which, for instance, is not being used for a long time, must nevertheless be stored in the pretensioned condition on a frame.

Another drawback is that, after providing the woven polyester gauze with holes, this gauze loses its dimensional stability, thus precluding the possibility of meeting the requirements applicable to a particular printing. A further drawback is that the known screen material does not very well assume its original condition after having been used, so that when using such screen material the quality of the product being printed greatly decreases after a relatively short period of time.

Still another drawback is that cross threads and weft threads of the woven polyester gauze are not anchored with each other, so that, when using a screen having screen openings of 400 mesh, it frequently occurs that a large number of openings have dimensions that differ from those desired.

At last, there is an important drawback in that rounded threads are used for said screen materials, as a result of which the permeability to material passing through the screen openings strongly depends upon the thickness of the threads from which the polyester gauze is made.

It is now the object of the invention to provide a screen material which does not have said drawbacks and which is particularly well suited for printings to be performed with great detail sharpness and detail fineness, without the need for said screen material to be stored in a pretensioned condition on frames, thus making it possible to gain considerable savings in terms of storage space requirements.

In addition, said screen material has to retain its dimensional stability and to provide for unlimited useability.

This object is attained according to the inven-

tion by the screen skeleton having a semi-circular cross section and a flat bottom and the screen having a fineness of between 250 and 1000 mesh; the upper side of the screen openings having an area which is larger than the lower side of the screen openings; each of the screen openings being defined by curved walls extending from the lower side of the screen opening to the upper side of the screen opening; said screen material being obtained by passing the bath solution, at least during part of the electrolytic depositing time, from the bottom side of said skeleton through the openings in the screen skeleton (3) connected as the cathode.

When using such a screen, printed products are obtained which have excellent properties, also when such screens are used over an extended period of time.

Concerning the invention mention is made of EP—A—0 049 022. In said publication, and particularly in Figures 7 and 9 a screen material is described having the same type of cross section of the lands as shown in Figure 2 of the application. The type of screen in this publication is however intended for use as a filter medium, as appears from the introductory part of the description.

In an article: "New Stencil Screen Developments for Thick Film Printing" in Solid State Technology, Vol. 26 (1983) No. 10; pp. 141—146 gauze type screens are described having the type of fineness as indicated for the screens of the invention.

The screens however are gauze type materials structured from stainless steel wire. This type of gauze screens show all disadvantages of lack of definition, stability etc. for which the screens of the invention offer a solution.

With particular advantage, the screen material consists of a cylindrical screen, which makes it possible to produce in a very simple manner printings having the detail fineness and great detail sharpness as desired.

The invention further relates to a method for manufacturing a screen for printing consisting of a metal screen obtained by electrolytic deposition of at least one metal upon a screen skeleton characterized in that for producing a metal screen having a fineness of 250 to 1000 mesh a screen skeleton is used having a semi-circular cross-section and a flat bottom, and the bath solution passes through the openings in said screen skeleton from the bottom side thereof during at least part of said electrolytic depositing time, said skeleton being connected as the cathode.

Other advantages will be more readily appreciated as the same becomes better understood by reference to the following detailed description and considered in connection with the accompanying drawings in which like reference symbols designate like parts throughout the figures.

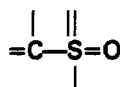
Figure 1 is a view of a screen material according to the invention;

Figure 2 is a sectional view of a screen material according to the invention; and

Figure 3 is a view of a cylindrical screen material according to the invention.

Figure 1 shows a screen material 1 consisting of a metal screen 1 obtained by electrolytic deposition of at least one metal 2 upon a screen skeleton 3. The screen has a fineness of 400 mesh, so that there are 400 openings 4 per 2,54 cm.

The electrolytic bath as used for depositing said metal is a well known electrolytic bath containing an organic compound comprising at least one unsaturated bond which does not belong to a



group such as butyne diol.

Figure 2 shows more particularly the shape of a number of openings in the screen. As seen, the free upper side 5 of the screen opening has a larger area than the area of the screen opening on the lower side of the screen 6.

The screen opening is defined by the curved walls 8 of the lands bounding the screen opening 4.

In addition, it is evident that the metal deposited by electrolytic deposition mainly extends on one side of the screen skeleton. On the other side of the screen skeleton, only a small layer thickness 7 of the electrolytically deposited metal has precipitated. This is more particularly shown in Figure 2.

The shape of the screen openings is obtained by connecting a screen skeleton as the cathode and by having the electrolytic solution flow in the direction from the cathode to the anode or in the reverse direction. Preferably the direction of flow is from the cathode to the anode.

The screen according to the invention is particularly well adapted for printings for which hitherto woven polyester gauze has been used.

The screen material according to the invention distinguishes itself very favorably from the woven polyester gauze by the dimensional stability of the screen material used, which results in the remaining screen material retaining its non-deformable character when forming the openings in the screen material, the screen permeability being no longer dependent upon the thickness of the lands of the screen material by properly selecting the walls of the screen openings, and, finally, the size of the screen openings being ensured at all times, also after an extended period of use, this being in contradistinction to applications using woven polyester gauze.

Figure 3 shows a cylindrical screen material according to the invention in the form of a cylindrical screen 1' said cylindrical screen material being particularly suitable for continuous printing.

Claims

1. A screen for printing, or the like, comprising a screen skeleton (3) in the form of a fine mesh and

a further layer of metal electrolytically deposited upon the screen skeleton characterized in the screen skeleton (3) having a semi-circular cross-section and a flat bottom and the screen having a fineness of between 250 and 1000 mesh; the upper side of the screen openings having an area which is larger than the lower side of the screen openings; each of the screen openings being defined by curved walls (8) extending from the lower side of the screen opening to the upper side of the screen opening; said screen material being obtained by passing the bath solution, at least during part of the electrolytic depositing time, from the bottom side of said skeleton (3) through the openings in the screen skeleton (3) connected as the cathode.

2. A method for manufacturing a screen for printing consisting of a metal screen obtained by electrolytic deposition of at least one metal upon a screen skeleton (3) characterized in that for producing a metal screen having a fineness of 250 to 1000 mesh a screen skeleton (3) is used having a semi-circular cross-section and a flat bottom, and the bath solution passes through the openings in said screen skeleton from the bottom side thereof during at least part of said electrolytic depositing time, said skeleton being connected as the cathode.

Patentansprüche

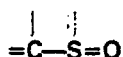
1. Sieb zum Drucken, oder dergleichen, enthaltend ein Siebskelett (3) in Form eines freien Gitters und eine weitere Schicht aus Metall, die elektrolytisch auf dem Siebskelett abgeschieden ist, dadurch gekennzeichnet, daß das Siebskelett (3) einen halbkreisförmigen Querschnitt und eine flache Unterseite hat und das Sieb eine Feinheit zwischen 250 und 1000 mesh hat, die Oberseite die Sieböffnungen eine Fläche hat, die größer als die Unterseite der Sieböffnungen ist, jede der Sieböffnungen durch gebogene Wände (8) begrenzt ist, die sich von der Unterseite der Sieböffnung zur Oberseite der Sieböffnung erstrecken, das Siebmaterial durch Durchleiten der Badlösung wenigstens während eines Teils der elektrolytischen Abscheidezeit von der Unterseite des Skeletts (3) durch die Öffnungen im Siebskelett (3) erhalten wird, das als die Kathode angeschlossen ist.

2. Verfahren zum Herstellen eines Siebes zum Drucken, bestehend aus einem Metallsieb, das man durch elektrolytische Abscheidung wenigstens eines Metalls auf einem Siebskelett (3) erhält, dadurch gekennzeichnet, daß zum Herstellen eines Metallsiebs einer Feinheit von 250 bis 1000 mesh ein Siebskelett (3) verwendet wird, das einen halbkreisförmigen Querschnitt und eine flache Unterseite aufweist, und daß die Badlösung durch die Öffnungen in dem Siebskelett von der Unterseite desselben während wenigstens eines Teils der elektrolytischen Abscheidezeit strömt, wobei das Skelett als die Kathode angeschlossen ist.

Figure 3 is a view of a cylindrical screen material according to the invention.

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Revendications

1. Ecran d'impression, ou équivalent, comprenant une armature d'écran (3) sous forme d'une maille fine et une autre couche de métal déposée électrolytiquement sur l'armature d'écran, caractérisé en ce que l'armature d'écran (3) a une section semi-circulaire et un fond plat, l'écran ayant une finesse comprise entre 250 et 1 000 mesh; le côté supérieur des ouvertures de l'écran ayant une surface plus grande que leur côté inférieur; chacune des ouvertures d'écran étant définie par des parois incurvées (8) allant du côté inférieur de l'ouverture à son côté supérieur; ledit produit pour écran étant obtenu en faisant passer la solution d'un bain, au moins pendant une partie du temps de dépôt électrolytique, à partir

du côté inférieur de ladite armature d'écran (3) à travers les ouvertures de l'armature d'écran (3), qui est montée en cathode.

2. Méthode pour fabriquer un écran d'impression consistant en un écran en métal obtenu par dépôt électrolytique d'au moins un métal sur une armature d'écran (3) caractérisée en ce que, pour produire un écran en métal ayant une finesse comprise entre 250 et 1 000 mesh, on utilise une armature d'écran ayant une section semi-circulaire et un fond plat, et en ce que la solution d'un bain passe à travers les ouvertures dans ladite armature d'écran à partir du côté inférieur, pendant au moins une partie du temps de dépôt électrolytique, ladite armature étant montée en cathode.

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