June 2, 1936. H. H. MEYER 2,042,476

PROCESS FOR PRINTING ON IRREGULAR SURFACES

Filed April 22, 1935 2 Sheets-Sheet 1

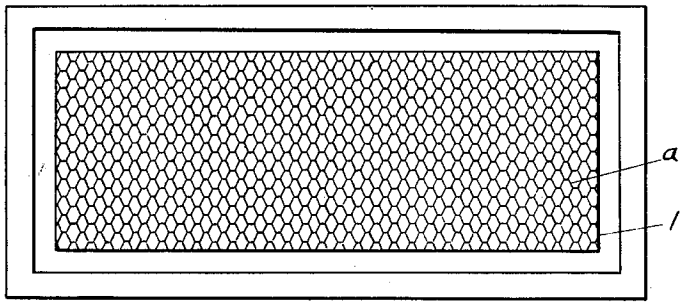


Fig. 1

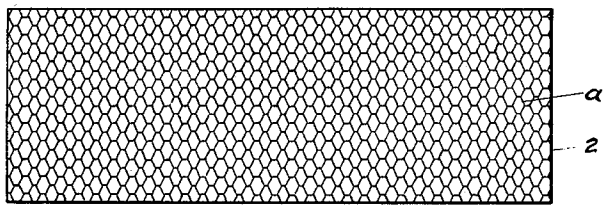


Fig. 2

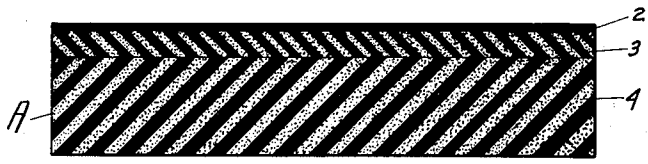


Fig. 3

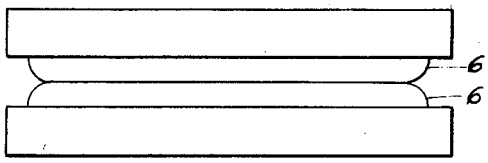


Fig 4

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PROCESS FOR PRINTING ON IRREGULAR SURFACES

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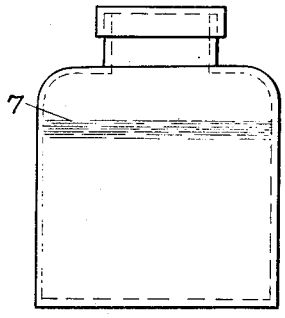


Fig. 5

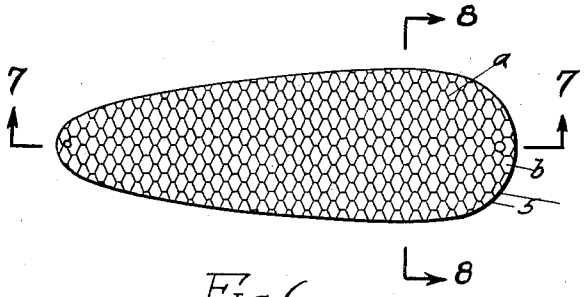


Fig. 6

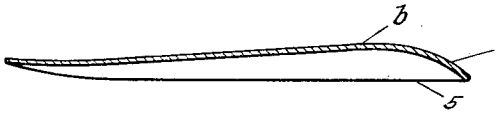


Fig. 7

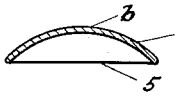


Fig. 8

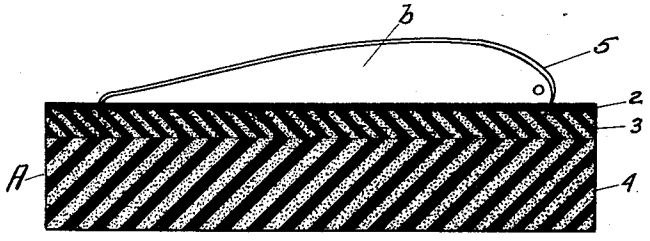


Fig. 9

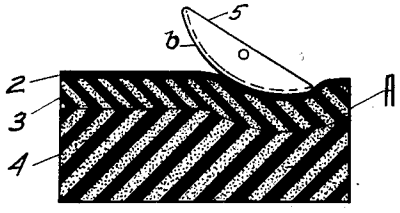


Fig. 10

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PROCESS FOR PRINTING ON IRREGULAR SURFACES

Henry H. Meyer, Detroit, Mich., assignor to Louis J. Eppinger, Detroit, Mich.

Application April 22, 1935, Serial No. 17,664

3 Claims. (Cl. 101—35)

This invention relates to a process for printing special designs or printed matter upon various or changeable irregular shaped surfaces.

The object of my invention is to provide means for printing special designs upon various different shaped surfaces of irregular and warped formation, and without changing of the means or equipment used.

Another object is to provide a process for printing designs upon irregular surfaces without the use of specially formed dies or moulds designed and formed to such object surface.

A further object is to provide a special process for the printing of designs on irregular surfaces by the use of a flexible printing block, adjustable to any surface, and that will operate without sliding or skidding of the type design at various distorted points of contact, preventing blurring of the printed matter as would result from curved die printing process.

These several objects are attained by the special process more fully hereinafter set forth.

Reference is made herein to the accompanying drawings, and similar parts thereon are marked by similar numerals or letters.

Fig. 1 is a plan view of a zinc etching made from a photograph or drawing of any special design desired to be printed on some irregular surface.

Fig. 2 is a plan view of a flexible rubber type mat made from the zinc etching shown in the Fig. 1.

Fig. 3 is a side view of a flexible printing block, having the rubber type mat shown in the Fig. 2 mounted thereon, and becoming a part thereof.

Fig. 4 illustrates a double inking pad closed together in a position for absorbing printing ink therein.

Fig. 5 is an elevation of an ink container, indicating any kind of suitable printing ink adapted for surface printing.

Fig. 6 is a plan view of a warped surface of a trolling spoon used for fishing upon which a special design has been printed by this process.

Fig. 7 is a vertical sectional view lengthwise through the illustrated trolling spoon taken on the line 7—7 of the Fig. 6, showing the longitudinal curves formed therein.

Fig. 8 is a cross-sectional view taken on the line 8—8 of the Fig. 6 showing the cross contour of the spoon to more clearly illustrate the resulting irregular warped spoon surface.

Fig. 9 is an elevation of the assembled printing block showing the irregular spoon surface being applied to the designed type mat mounted thereon.

Fig. 10 is an end view of the same printing block and spoon showing the rolling process for applying the special design printing to the warped irregular spoon surface.

Much difficulty has been experienced in transferring or printing designs on irregular surfaces, and various methods and processes have been devised for same, such as special transfers, or paint spraying through a protective screen design, &c. but direct printing has been found extremely difficult and without any great degree of success, due to the skidding and blurring of certain sections of the type design as same is passed over or fitted to the irregular surface to be printed.

In my process it is possible to accomplish the printing of any chosen design, on any irregular surface, and without skidding or blurring of the design type at any point or section thereof, although it requires various consecutive steps in the operation and in the order hereinafter set forth. The process is herein applied to the printing of a special design *a* on the warped and irregular surface *b* of a trolling spoon 5 for which it is specially applicable. The process can best be understood when described together with the accompanying drawings and applied to a specific object as illustrated therein.

In general, I accomplish the irregular surface printing by the use of a flexible printing block A formed of a flexible rubber type mat having the desired design thereon and mounted on a resilient block support of specially arranged rubber materials, assembled and mounted on a suitable support or table. When the type mat surface is properly inked, the irregular surface to be printed is contacted at one edge thereof, depressed and rolled thereover, from one side to the other.

The special desired design, or matter to be printed is first drawn in ink on plain white paper and then transferred to a metal etching 1 by some suitable photographic process now commonly used in making zinc, (or copper) etchings used for printing purposes, the etching process being continued sufficiently to effect a coarse or deep cut etching, leaving only the design surface lines *a* in true formation. The zinc etching 1 thus formed is used as a matrix in forming a rubber type mat 2 by the ordinary process now used to form rubber stamps from any set type or design, and resulting in a like formation with the surface lines *a* as in the

zinc etching 1. The rubber mat 2 is made very thin, and of firm but flexible rubber material. The type mat 2 is mounted, preferably by suitable rubber cement, upon a slightly thicker sheet 3 of firm sponge rubber material, and which in turn is mounted, also preferably by suitable rubber cement, upon a thick block of soft sponge rubber 4, as illustrated in the Figs. 3, 9, and 10 of the drawings. The firm sponge rubber sheet 3 acts as a support for the type mat 2 and provides sufficient resistance in bending to effect the printing by conforming the mat to any irregular surface depressed therein. The supporting block 4 of soft sponge rubber provides displacement for the irregular shaped object 5 to be printed, so that the full warped surface *b* may be contacted with the type mat 2 when depressed therein, as illustrated by the trolling spoon 5 in the Fig. 10 of the drawings.

The surface of the type mat 2 is thoroughly inked, preferably the use of the ink pads 6 provided in pairs upon which a small quantity of suitable printing or transfer ink 7 has been deposited, said pads being thoroughly rubbed together to distribute and absorb the ink therein. One of the ink pads 6 is pressed on the face of the rubber type mat 2 and drawn thereover several times, using sufficient pressure to engage and depress and slightly distort the rubber mat design surface lines *a* and completely fill the rubber pores, yet without leaving any residue or surplus ink thereon. The printing block A is placed upright upon any suitable support or table, and the irregular surfaced object to be printed, herein illustrated as the shell of a trolling spoon or bait 5, is contacted therewith at one edge, and by applying pressure thereto, depressing the flexible rubber type mat 2 and its resilient sponge rubber support material, until the irregular surface edge is fully contacted, followed by rolling of said object 5 under continued pressure, over the depressed type mat surface 2 and printing the design thereon. By depressing the irregular edge of the object 5 into the flexible printing block before the rolling and printing operation is commenced, the type mat surface 2 is properly adjusted thereto, and without sliding or blurring of the printed design, and the flexible type mat surface will continue to readjust ahead of the advancing object 5 as the same is rolled thereover, and without sliding thereon. Should the irregular surface of the trolling spoon 5 be depressed directly on, or into the printing block A, as in ordinary printing, the type mat 2 would slide thereover at various sections in adjusting to the irregular surface, blurring and destroying the printed design transferred thereto.

The type or kind of ink to be used in my process may be varied depending upon the surface to be printed and the use to which the object is to be applied.

Having fully described my special process for printing on irregular surfaces, what I claim as my invention and desire to secure by Letters Patent is:

1. A process for printing any chosen design on any irregular shaped warped surface, consisting of first producing the design in ink on white paper and then reproducing same on a zinc etching of deep line structure, the zinc etching then being used as a matrix for forming a thin, flexible rubber type mat having the design thereon, said type mat being mounted on a resilient printing block of sponge rubber and coating the type mat design lines with reproducing ink, followed by contacting the edge of an irregular shaped object surface upon which the design is to be printed with one edge of the type mat design surface and depressing the same into the resilient printing block until the irregular shaped surface edge is contacted therewith the full length thereof, then rolling said irregular object surface over the type mat design while so depressed.

2. A process for printing any chosen design on any irregular shaped surface, consisting of first reproducing said design on a zinc etching of deep line structure, the zinc etching then being used as a matrix for forming a thin, flexible rubber type mat having the design thereon, and said mat mounted on a resilient printing block of sponge rubber and the type mat design lines coated with reproducing ink well rubbed in, followed by contacting the edge of the irregular shaped object surface upon which the design is to be printed with one edge of the type mat design surface, depressing the edge into the resilient printing block until the irregular surface edge is contacted the full length thereof, then rolling the irregular shaped object surface over the type mat design while so depressed.

3. A process for printing any chosen design on any irregular shaped surface, consisting of re-producing the said design on a thin, flexible rubber stamp type mat, said type mat being mounted on a resilient printing block of soft sponge rubber but provided with a stiffening sheet of sponge rubber therebetween, and the type mat design lines well coated with reproducing ink, followed by contacting the edge of an irregular shaped surface upon which the design is to be printed, with one edge of the type mat design surface, depressing the edge into the resilient printing block until same is contacted the full length thereof, then rolling said irregular shaped surface over the type mat design while so depressed.

HENRY H. MEYER.