No. 642,270. Patented Jan. 30, 1900.

H. A. SMITH.

PROCESS OF MAKING TRANSPARENCY SIGNS.

(Application filed Mar. 10, 1899.)

(No Model.)

Fig. 1.

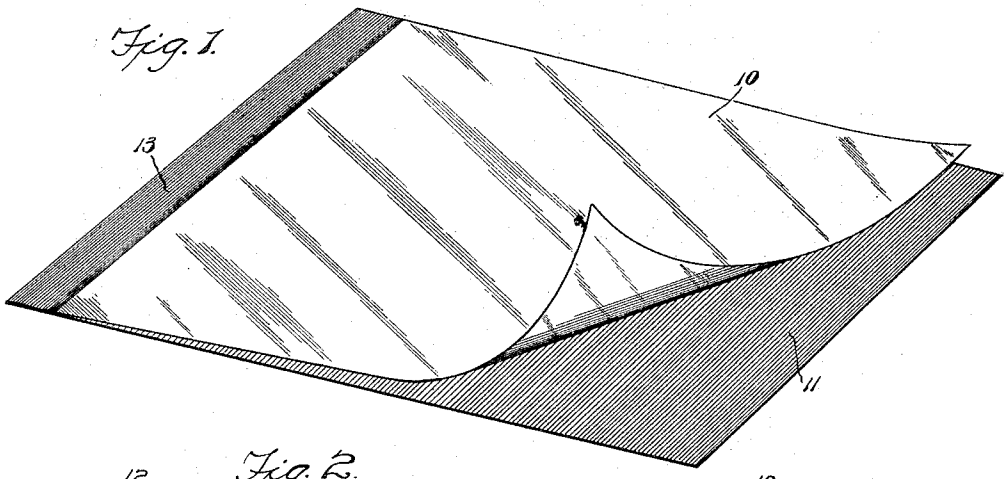


Fig. 2.

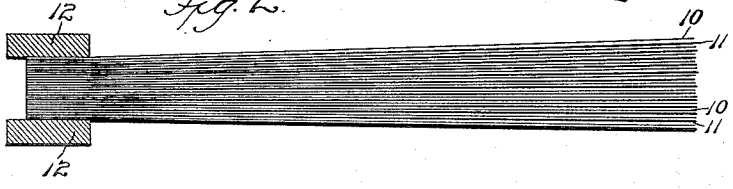


Fig. 3.



Witnesses

Ralph A. Shepard.

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By his Attorneys,

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UNITED STATES PATENT OFFICE.

HENRY A. SMITH, OF COSHOCTON, OHIO, ASSIGNOR OF ONE-HALF TO THE STANDARD ADVERTISING COMPANY, INCORPORATED, OF SAME PLACE.

PROCESS OF MAKING TRANSPARENCY-SIGNS.

SPECIFICATION forming part of Letters Patent No. 642,270, dated January 30, 1900.

Application filed March 10, 1899. Serial No. 708,563. (No specimens.)

To all whom it may concern:

Be it known that I, HENRY A. SMITH, a citizen of the United States, residing at Coshocton, in the county of Coshocton and State of Ohio, have invented a new and useful Improvement in the Manufacture of Transparent Signs and Labels, of which the following is a specification.

My invention relates to the manufacture of transparent signs, labels, wrappers, or sheets particularly designed for advertising and decorative purposes and adapted for attachment to transparent supporting-surfaces, such as glass.

In multicolored printing in connection with the preparation of transparent signs and labels it is necessary to use a paper of comparatively light weight and of a peculiar texture, adapting it not only to properly receive the impression, but to be rendered transparent by a coating of varnish, so that the words, characters, drawings, or devices may be printed upon the reverse side of the object-sheet and viewed therethrough. In practice I prefer, for instance, to use a paper which in sheets of seventeen by twenty-two inches runs about seven and one-half pounds to the ream, this being about the maximum weight which can be employed for securing satisfactory results. In lithographing, or "surface" printing, as distinguished from type or letter-press (known as "relief") printing, from zinc or copper plates, and particularly in multicolored printing, where the characters composing a design are of different colors or combinations of colors and are applied successively, it has been found that paper of the weight suitable for transparency labels and signs is liable to stretch and become distorted, whereby the object-sheet cannot be printed successively in a plurality of colors to a "register," by which is meant that the distortion of the sheet prevents the proper and uniform meeting and joining of the colors and also prevents the proper registration of the different parts of the printing member with the corresponding parts of the previously-printed portions of the design. Lithographing or surface printing causes this stretching or straining of the object-sheet, for the reason that the entire area of the stone comes into heavy contact with the opposing tympan, which is of rubber or analogous material, and it frequently occurs that the sheet will be not only strained and stretched, but fractured and otherwise mutilated, and while this stretching and straining of the object-sheet is not noticeable in connection with "relief-printing," as by means of type or letter-presses, from the fact that in relief-printing only that area or surface which prints comes in contact with the opposing tympan, which is provided with a hard smooth surface, the printing by the lithograph or surface process is preferable as producing a more decorative and finished design and as being otherwise suited to the present requirements of the trade in this class of work. Thus as the article cannot be produced satisfactorily from paper of greater weight or different texture and yet secure the desired transparency of the resulting sheet, and as paper of the proper weight and texture cannot be handled upon a lithograph-press, particularly in multicolored printing, on account of the stretching and non-registering of the impressions, it becomes necessary in order to obtain the advantages of lithographic work to provide a process of treating the object-sheet whereby the proper registration of the characters and colors may be insured, and to provide such a process is an object of my invention.

In attaining this object my invention consists, essentially, in providing the object-sheet with a backing-sheet applied to the object-sheet before the latter is subjected to strain or, in other words, prior to the printing and so securing the backing-sheet to the object-sheet, adhesively or otherwise, as to prevent the objectionable stretching and insure the desired printing to register.

Furthermore, my invention consists in providing a backing-sheet which is not only stronger and thicker than the object-sheet, but is of a softer texture, whereby it is adapted to serve as a cushion to relieve the object-sheet of the strain of the impression and also to strengthen the object-sheet at the gripper-line or at that edge engaged by the grippers of the lithographing-press, whereby the fracture and mutilation of the sheet by means of the grippers are prevented. Also said back-

ing-sheet is adapted to form a reasonably stiff and even edge for contact with the side guides, whereby the proper register in the printing of the object-sheets is maintained.

Various means may be employed for properly securing the object-sheet to the backing-sheet preparatory to passing them through the lithograph-press; but in practice I prefer to proceed as follows: The object-sheet is first coated on one side with a clarifying-varnish of any suitable composition, any of those varnishes now known as adapted for this purpose being suitable in connection with my improved process. These coated sheets are then laid singly in trays for a length of time sufficient to allow them to partly dry or partly oxidize, but not harden. It is obvious that the length of time necessary to secure this partial hardening of the varnish coating will vary according to the composition of the varnish; but before the varnish becomes sufficiently dry to entirely resist the effect of pressure or, in other words, is so dry as to be non-adhesive the object-sheets are interleaved with backing-sheets of paper having a loose or soft texture, and a pack or bundle of these interleaved alternately-arranged object and backing sheets to a thickness of, for instance, five-eighths of an inch, is introduced at one edge between the jaws of a screw-press or between two flat rules adapted to be arranged in a screw-press or similar device. Pressure being applied to the edge of the pack or bundle of interleaved sheets, it is obvious that the varnish-coated surface of each object-sheet will adhere (throughout an area equal with that to which pressure is applied) to the adjacent backing-sheet, and therefore when the object-sheets are removed from the press each will be found to be attached at one edge to a backing-sheet, while the remaining portion of the surface of the object-sheet or that portion which was not subjected to pressure remains free or unconnected with the backing-sheet. It is essential in carrying out the present invention that the transparent object-sheet and the backing-sheet be held together along a single line of contact and entirely disconnected at all other points. This is rendered necessary by reason of the fact that the design is impressed upon the object-sheet by a stone-lithographic process in a cylinder-press. In operating with a lithographic press of this type it would be entirely impracticable to join the sheets together at two, three, or four edges, because if the two sheets are joined except along the front edge or gripper-line the softer sheet will necessarily wrinkle very badly and entirely destroy the effect of the work. Inasmuch as the joined object and backing-sheets are caught by the line of grippers at one edge and make the revolution with the cylinder over the stone carrying the impression, said sheets must be separate and free except just at the point or edge where the grippers take and hold the same. By reason of thus assembling the object and backing sheets there is no tendency whatever of the same to wrinkle as they are carried around with the cylinder of the press, inasmuch as the direction in which they are rotated necessarily tends to smooth the same out rather than having the opposite effect, and in this particular alone the present process is radically different from the ordinary lithographic processes now in vogue for manufacturing transparency signs and labels. Another advantage to note in this connection is that no foreign adhesive agent is employed to join the object and backing sheets together along the single line of contact, inasmuch as the material which clarifies the paper is utilized to secure the necessary adherence, and this has been found sufficient for all practical purposes and to provide for holding the backing-sheet to the object-sheet not only during the printing operation, but also until it is ready to apply the sign or label to a window. The reinforced object-sheets are now coated with varnish upon the other side or the side remote from the backing-sheet, and when the second coating of varnish has been allowed to dry sufficiently the reinforced sheets are ready for introduction into the lithographing-press to receive the successive impressions necessary to produce the desired colors composing the design. The backing-sheet, to which the object-sheet is attached, serves to relieve the object-sheet of the strain due to the yielding of the tympan of the press and at the same time compensates by its own compression for any inequalities in the surface of the stone, thereby producing a cushioning effect which insures a satisfactory impression of the characters and figures composing the design. After the completion of the printing step of the process the face of the object-sheet or the side thereof which is opposite to that receiving the impression of the design may be coated with a suitable adhesive material, also transparent, to avoid obstructing the view of the design, this adhesively-prepared or gummed surface thus being toward the backing-sheet and being protected by the backing-sheet until such time as it may be desired to apply the sign or label to glass or other supporting-surface, when, of course, the backing-sheet is removed.

In order that the nature of my invention may be more fully understood, I have illustrated, in—

Figure 1 a view of the object-sheet and the attached backing sheet as seen preparatory to arranging in the lithograph-press; Fig. 2, a view of the interleaved object and backing sheets while causing the adhesion between the varnished surfaces of the object-sheets and the edge portions of the backing-sheet, and Fig. 3 a face view of a sign when completed and stamped out to the desired shape ready for application to a supporting-surface.

After coating the object-sheet at one side with the clarifying-varnish and allowing said

varnish to partly dry, in accordance with the foregoing description, said object-sheets 10 and the backing-sheets 11 are interleaved, as shown in Fig. 2, and a bundle or group of such interleaved sheets is arranged between the jaws 12, which may be the members of a press or may be straight edges or rulers applied to the strips preparatory to introduction in a press. To force these jaws 12 toward each other to compress the interposed edges of the interleaved sheets and produce the necessary adhesion, respectively, of the object-sheets to the backing-sheets, the pairs of sheets are removed and appear as indicated in Fig. 1, where the shaded surface 13 represents the adhering portions of the object and backing sheets. The exterior surface of the object-sheet or that which is remote from the backing sheet 11 is now coated with the clarifying-varnish and is allowed to dry, after which the sheet, as shown in Fig. 1, is introduced into the lithograph-press and passes therethrough the necessary number of times to secure the desired impressions of the characters and colors, whereupon, if the design or exterior configuration of the print require, the same may be stamped out, as indicated in Fig. 3, it being understood that the design is stamped upon the rear surface of the object-sheet, whereby the figures and characters are viewed through the sheet and also through the transparent supporting-surface, to which the design is attached when in use.

It will be seen from the foregoing description that I accomplish the printing upon the varnished surface of the object-sheet, and while the advantages of the backing-sheet or the reinforcement of the object-sheet may be attained independently of said specific method of printing I prefer the described order of steps in the manufacture of transparent signs and labels as producing a more finished article having increased durability. It will be seen, furthermore, that by applying the clarifying-varnish to the object-sheet preparatory to printing said sheet I secure a uniformity in the transparency, which may under certain circumstances be varied when the impression of the design is accomplished upon the object-sheet previous to the clarifying thereof. Furthermore, it is obvious from the foregoing description that by providing the object-sheet, at least upon one side, with a coating of the clarifying-varnish I am enabled to utilize this coat of varnish as the adhesive medium for attaching the object-sheet along the line of forced contact to the backing or reinforcing sheet, whereby the application of auxiliary means for this purpose requiring a further step in the process is avoided. The same medium which is employed for clarifying the paper thus serves to adhesively secure the backing or reinforcing sheet, as I have found that by subjecting the varnished sheet to pressure at a certain stage in the drying thereof I am enabled to utilize a certain adhesive quality which is inherent in any of the clarifying-varnishes of which I am aware. In other words, it is not necessary that the clarifying-varnish possess any auxiliary adhesive ingredient, but simply that the interleaving of the object and backing sheets shall occur at an intermediate state in the drying of the varnish coat, whereby the surface when unsubjected to pressure will not adhere to the object-sheet, but when subjected to pressure will be affected to accomplish the desired adhesive engagement.

It has been pointed out at length why it is necessary to the successful carrying out of the invention that the transparency or object sheet and the backing-sheet should be joined solely along a single line of contact at one edge thereof, while being disconnected from each other at all other points, and it may be further observed that the separate sheets remain thus connected until the sign or label is to be attached to a glass. It will thus be seen that the paper backing-sheet, which is originally joined to the transparent object-sheet along the front edge or gripper-line, accompanies the object or transparency sheet through the gumming-machine and is cut up with the signs or labels in a final operation, thus becoming the instruction-sheet, upon which the necessary instructions for using the sign or label may be printed. Without such an instruction-sheet a similar sheet would have to be added to the sign or label. In this connection it will be noted that after the completion of the sign or label the backing-sheet not only serves as an instruction-sheet, upon which directions for using are printed, but at the same time forms a protective sheet for the sign or label until it is ready to attach the same to a glass.

In using the sign or label the same, with the backing or instruction sheet attached, is dipped in water to permit of the separation of the separate sheets and the application of the gummed side of the sign or label to the glass.

Having described my invention, what I claim is—

1. As an improvement in the manufacture of lithographic transparency-signs and the like, the process consisting of joining solely along a single line of contact, a transparent object-sheet and a backing-sheet, and subsequently passing the object-sheet, with the backing-sheet attached, through the press.

2. In the manufacture of lithographic transparency-signs and the like, the process consisting of joining solely along a single line of contact, a varnish-clarified object-sheet and a pliable backing-sheet, and subsequently passing the object-sheet, with the backing-sheet attached, through the press.

3. In the manufacture of lithographic transparency-signs and the like, the process which consists in adhesively joining solely along a single line of contact, a varnish-clarified object-sheet and a backing-sheet, and leaving said sheets free and disconnected at all other

points, and subsequently passing the object-sheet, with the backing-sheet attached, through the press.

4. In the manufacture of lithographic transparency-signs and the like, the process which consists of joining by the adhesion of the surfaces, a varnish-clarified object-sheet and a pliable backing-sheet, and subsequently passing the object-sheet, with the backing-sheet attached, through the press.

5. In the manufacture of lithographic transparency-signs and the like, the process which consists of joining solely along a single line of contact, a varnish-clarified object-sheet and a backing-sheet, stronger than the object-sheet and of softer texture than the same, and subsequently passing the object-sheet, with the backing-sheet attached, through the press.

6. In the manufacture of lithographic multicolor transparency-signs and the like, the process consisting of coating the object-sheet with clarifying-varnish, applying a backing-sheet to the varnish-coated surface of the object-sheet, causing the adhesion of the two sheets solely by compression along a single line of contact without extra adhesive material, and subsequently passing the object-sheet, with the backing-sheet attached, through the press, substantially as described.

7. In the manufacture of lithographic multicolor transparency-signs and the like, the process consisting of coating the object-sheet at one side with a clarifying-varnish, then applying a backing-sheet to said varnish-coated surface of the object-sheet, and joining the same thereto along a single line of contact, then applying a coat of clarifying-varnish to the opposite surface of the object-sheet, and finally applying a printed character or design to a varnished surface of the object-sheet.

8. In the manufacture of transparency signs, labels, and other articles, the herein-described process consisting of coating the object-sheet with clarifying-varnish, partly drying said varnish, then applying a backing or reinforcing sheet to the varnish-coated surface of the object-sheet, then causing adherence of the object-sheet to the backing-sheet upon a line of forced contact, and subsequently applying a printed character or design to the object-sheet, substantially as specified.

9. In the manufacture of transparency signs, labels, and other articles, the herein-described process consisting of coating the object-sheet at one side with a clarifying-varnish, partly drying said varnish, then applying a backing or reinforcing sheet to the varnish-coated surface of the object-sheet, then causing an adherence of the object-sheet to the backing-sheet upon a line of forced contact, then applying a coating of clarifying-varnish to the exposed surface of the object-sheet, and finally ornamenting the exposed varnish-coated surface of the object-sheet, substantially as specified.

10. In the manufacture of transparency-signs and the like, the process consisting of joining solely along a single line of contact a varnish-clarified object-sheet and a backing-sheet, and subsequently applying a printed character or design to a varnished surface of the object-sheet.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HENRY A. SMITH.

Witnesses:
A. WESTERLIND,
JOS. L. RUE.