May 11, 1943. F. KRONER 2,318,949

IMAGE SHEET

Filed Sept. 30, 1938

Fig. 3.

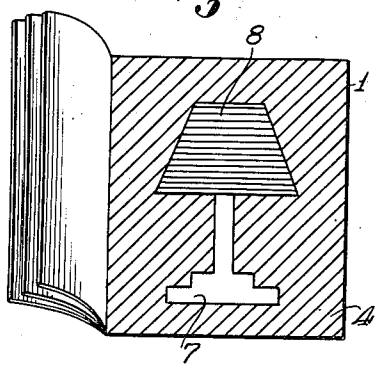


Fig. 2.

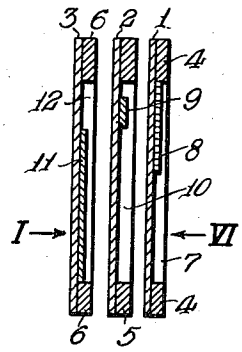


Fig. 1.

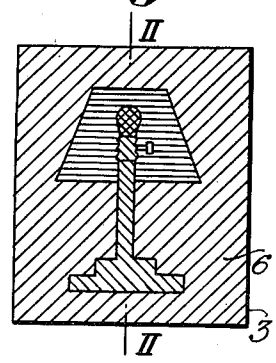


Fig. 4.

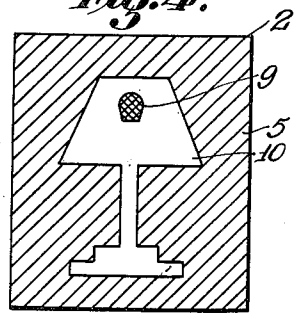


Fig. 7.

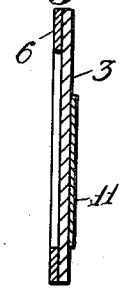


Fig. 6.

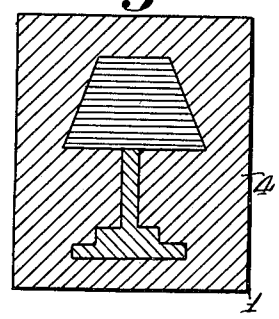


Fig. 5.

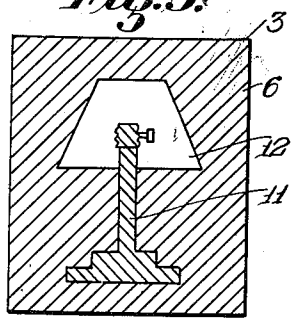


Fig. 8.

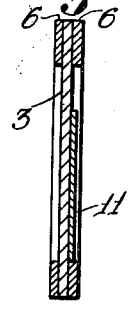


Fig. 9.

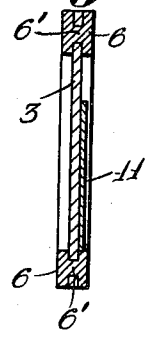
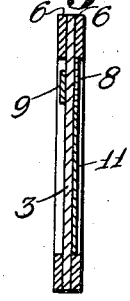


Fig. 10.



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UNITED STATES PATENT OFFICE

2,318,949

IMAGE SHEET

Friedrich Kroner, Berlin-Charlottenburg, Germany, assignor to Transart Aktiebolag, Goteborg, Sweden

Application September 30, 1938, Serial No. 232,538
In Germany December 20, 1937

1 Claim. (Cl. 35—26)

This invention relates to the treatment of thin transparent image sheets and to books or packs comprising such sheets.

In my copending patent application, Serial No. 170,225, filed October 21, 1937, I have described a method for treating sheets of the kind referred to so as to prevent them from sticking together, to reduce the friction between superposed sheets and to facilitate the separation thereof. To this end, I have provided the single sheets with separating layers or coatings at or near their edges.

It is an object of the present invention to apply the said edge coatings in such a manner that they improve the total impression of the image sheets.

Another object of the invention is to enhance the effect of the images on the image sheets and to remove or at least reduce reflections from the blank surface of the image sheets.

Still another object is to produce a composite image effect by superposition of several sheets treated according to the invention.

Still another object is to treat a part, more particularly the marginal portion or portions of the sheet in such a manner that it becomes similar to normal paper, as to its appearance and "touch," while preserving the special features of the transparent cellulose material as far as the rest of the sheet is concerned.

With these and other objects in view, as may become apparent from the following disclosure, the invention consists of the structures herein pointed out, illustrated by the drawing, and hereinafter claimed.

The character of the invention, however, may be best understood from the following description, particular reference being made to the accompanying drawing in which—

Fig. 1 is a plan view in the direction of the arrow I in Fig. 2 of a sheet package showing a composite picture produced by three superposed sheets.

Fig. 2 is a section on line II—II in Fig. 1.

Fig. 3 is a plan view of sheet 1 in Fig. 2.

Fig. 4 is a plan view of sheet 2 in Fig. 2.

Fig. 5 is a plan view of sheet 3 in Fig. 2.

Fig. 6 is a plan view in the direction of arrow VI in Fig. 2, of the sheet package shown in Fig. 2.

Fig. 7 is a section through an embodiment of a sheet according to the invention wherein an opaque layer is provided on one side of the sheet and the image portion is on the other side of the sheet.

Fig. 8 is a section through an embodiment wherein an opaque layer is provided on each side of the sheet, the image portion being on one side.

Fig. 9 is a section through an embodiment essentially like that of Fig. 8, means being provided for interconnecting the opaque layers through a perforation or perforations in the sheet.

Fig. 10 is a section through still another embodiment wherein an image portion as well as an opaque layer is provided on each side of the sheet.

Referring now to the drawing in greater detail, and first to Figs. 1 and 2, three sheets 1, 2, and 3 are superposed in accurate register of their corresponding parts. The sheets consist of thin cellulose material which is perfectly transparent like glass and permits printing of coloured opaque images upon its surface. Various materials, such as cellulose derivatives, more particularly cellulose acetate, cellulose nitrate, regenerated cellulose, acetyl cellulose and the like are known for this purpose. Unfortunately, all of these materials produce high surface adhesion and tend to stick together by mutual cohesion and by electrostatic effects, so that it is very difficult to separate them and to turn over a single sheet. Moreover, the said sheets have a very smooth surface tending to reflect the light.

Now, I provide on each of the sheets 1, 2, 3 an opaque coating 4, 5, or 6 respectively covering the whole surface of the image side of the sheet except the image region thereof. The "image region" in this case comprises not only the surface area where the image is applied on the respective sheet, but it comprises also those portions of the sheet where it is intended to render visible an image or image portion of any other of the superposed sheets through the transparent upper sheet.

For example, in the drawing a composite picture of a lamp has been shown. Sheet 1 (Fig. 3) comprises the image 8 of the lamp screen, marked by horizontal hatching. The rest of the surface of the sheet is covered by the opaque coating 4, but a window 7 is left transparent for the purpose which will be described later. The coating 4 preferably consists of an opaque lacquer, varnish, paint or the like applied by printing, spraying or spreading so that a matte, paper-like surface is produced, but it is also contemplated to apply a thin layer of paper or the like or to provide a pattern instead of a uniform color. In some instances, a transparent or translucent coating

may be applied. Metal deposits may be used or metal dust may be admixed to the coating material so as to produce a metallically conductive layer and to prevent electrostatic effects.

Sheet 2 carries the image 9 of the bulb. The opaque coating 5 in this case leaves a transparent window 10 for the purpose which will also be described later. Sheet 3 carries the image of the foot or base 11 of the lamp and a window 12 has been left free by the opaque coating. It will thus be understood that when superposing the three sheets 1, 2, 3 in the manner shown in Fig. 2 in accurate register and viewing the pack in the direction indicated by arrow I, the composite picture shown in Fig. 1 will be seen as the image portions 8 and 9 become visible through the windows 10 and 12 of the upper sheets, while when viewing the picture in the direction indicated by arrow VI, the composite picture shown in Fig. 6 will result as only a part of the component image 11 becomes visible through the window 7 of sheet 1. The two pictures, Fig. 1 and Fig. 6, are distinguished by the fact that in Fig. 1, the bulb and the foot portion extending into the screen are visible and the screen is e. g. shown from its inside, in an axial section, while in Fig. 6, the outside of the screen is shown and the bulb and foot portion are covered by the screen 8.

It will be clear that while in the present instance a relatively simple article forms the subject matter of the pictorial representation, it is possible in the same manner to illustrate very complicated machines or apparatus, for example, photographic cameras, in such a manner that the inner structure is visible from one side of the pack while the outer appearance is shown from the opposite side. In each case, the single images as well as the composite picture will be much more effective due to the background surface formed by the opaque layers like 4, 5, 6. It seems that the contrast formed between the image and the background enhances the pictorial effect of the picture as compared to a picture having transparent light-reflecting areas. A further favourable effect is produced since the sheets carrying the component images show the over-all contours of the article to be illustrated at the same time in the form of the windows as at 7, 10, 12 so that the position of the respective component part in or with respect to the total apparatus or machine is indicated also.

In view of the background effect produced by the said opaque marginal coating it will not be necessary to provide an additional background and it is possible to use the image sheets as a pack or package without an additional cover. On the other hand, in order to ensure accurate register of the single sheets, it is advantageous to bind them together in the form of a book and a background or other pictorial representation may in this case be applied to the inside of the book covers, if desired.

Apart from the favourable optical effect of the sheets treated by my novel process herein described, the sheets do not stick together and are much more convenient in use. The separation is more effective than in the case of the edge coating described in my prior patent application Serial No. 170,225, because the larger surface covered by the coating effects a better electric insulation and thus prevents electrostatic effects.

In some instances it may be useful to provide the marginal coating on the back of the image side, as shown at 6 in Fig. 7 of the drawing, or on both sides, as shown at 6, 6 in Fig. 6 of the drawing, and where electrically conductive coatings are used, the said coatings may be connected with each other, for example through a perforation 6' in the sheet, as shown in Fig. 8 of the drawing, to permit leading off any electrical charges.

Furthermore, it will be understood that the marginal coating may also be used to form a gauge mark for printing or superposing the sheets. Page numerals or any other inscriptions may also be applied to the said coating and any other features described in my said prior application may be used in connection with the present invention as well.

While normally my novel image sheets will be used in the form of a book or pack comprising a plurality, that is to say, at least two, sheets, it may sometimes be advantageous to provide even single image sheets with my marginal coating. More particularly, where different images are applied on the two sides of a sheet, such marginal coating may be applied on one or both sides. Assuming the sheet 2 shown in Fig. 4, besides having applied on the front side an image of the bulb 9 would have applied to its back an image of the rest of the lamp, within the space designated 10, this figure might be taken as an example of such a single sheet provided with a marginal coating 5 on one or both sides of the sheet.

Figs. 7 to 10 of the drawing show several variations in the relationship between the sheet 3, the opaque layer 6 and the image portion 11. The variation comprising the image portion on one side of the sheet and the opaque layer on the other side thereof is shown in Fig. 7. According to Fig. 8, an opaque layer is also added to the side bearing the image layer. Fig. 9 shows the further expedient of perforating sheet 3 to provide perforations whereby the opaque layers on the two sides of the sheet may be interconnected at 6'. Finally, Fig. 10 shows an opaque layer 6 on each side of sheet 3, an image portion 9 on one side of the sheet, and image portions 8 and 11 on the other side of the sheet.

Having thus described the present invention, what is claimed is:

A device of the character described comprising a plurality of superposed and separable thin image sheets of flexible transparent material, some at least of said sheets bearing a portion only of a composite total picture, said picture being formed by superposition of said sheets, each successive sheet having interposed therebetween an opaque layer of metallically conductive color extending in all directions beyond the outermost contours of the composite total picture and to the edges of said sheets whereby any surface attraction between said sheets is proportionately reduced, and a transparent portion extending within the contours of the composite total picture and occupying the parts not occupied by the said portion of the composite total picture, said sheets being arranged in such a manner relative to each other that the outermost contours of the composite picture on the different sheets coincide.

FRIEDRICH KRONER.