Oct. 21, 1941. L. B. PICKLEY 2,260,092

METHOD OF CREATING CARTOON EFFECTS

Filed Dec. 26, 1939 2 Sheets-Sheet 1

FIG. 1

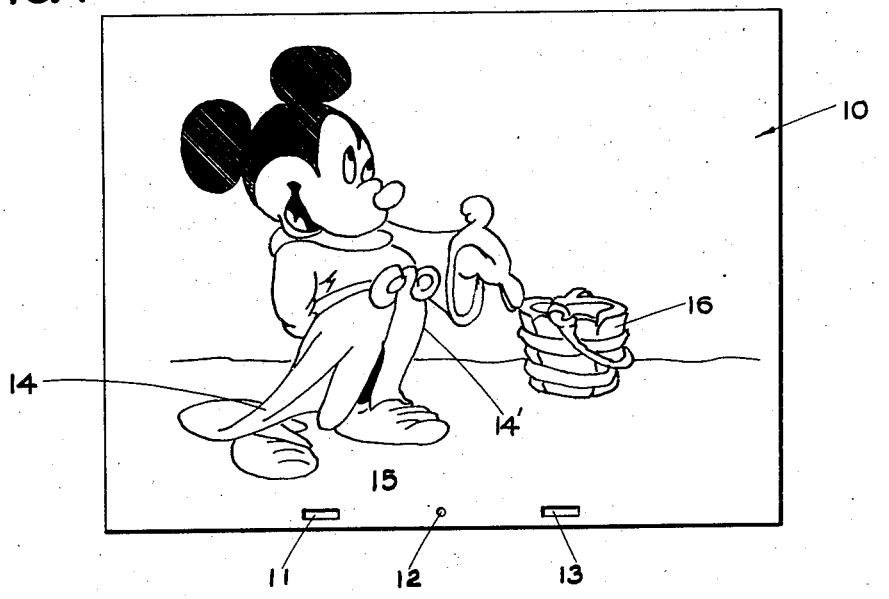
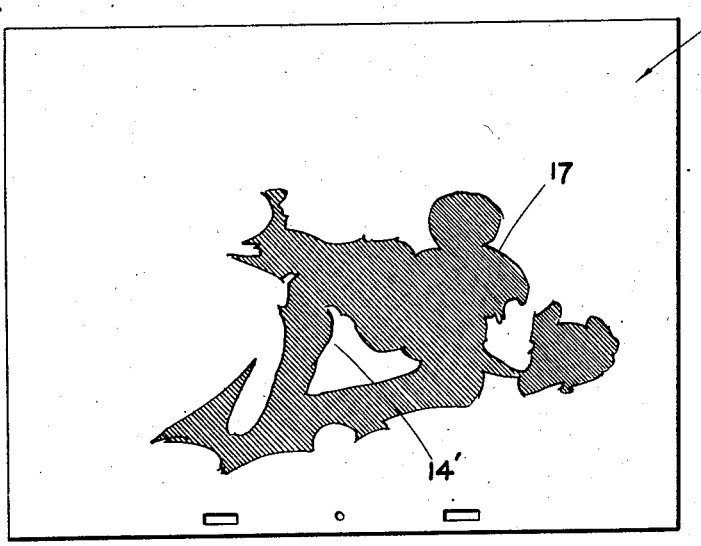


FIG. 2



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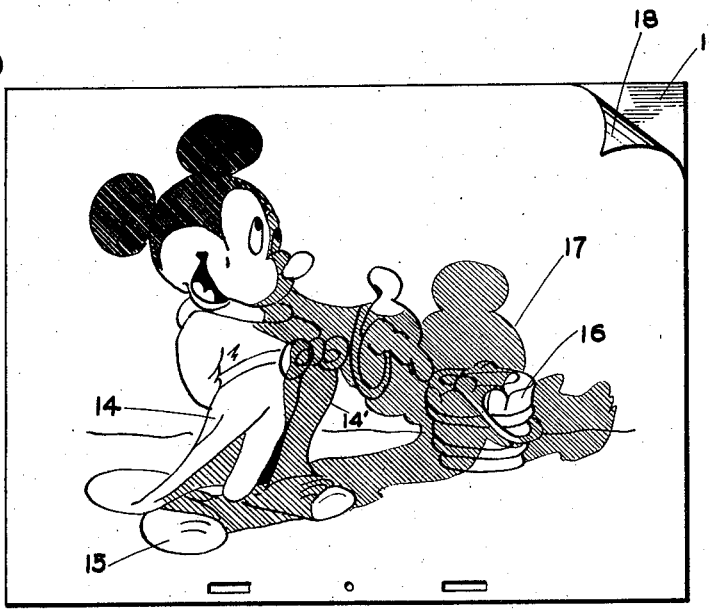
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FIG. 3



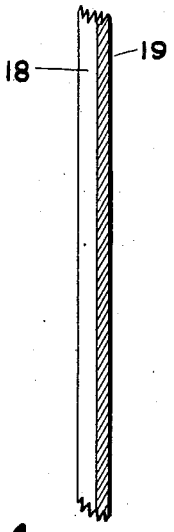


FIG. 4

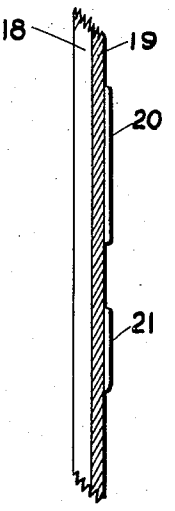


FIG. 5

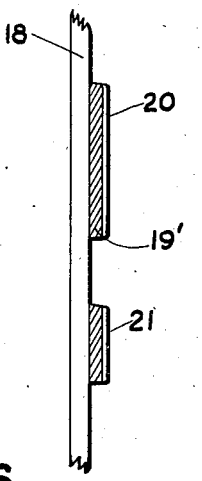


FIG. 6

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2,260,092

METHOD OF CREATING CARTOON EFFECTS

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Application December 26, 1939, Serial No. 310,929

2 Claims. (Cl. 88—16)

The present invention pertains to methods for use in animated cartoon photography. The invention is particularly directed towards methods whereby effects of roundness or depth may be imparted to the drawings or paintings and to methods whereby realistic shadows may be depicted upon the drawings so that the completed scenes more accurately and pleasingly depict the characters and other objects portrayed therein.

Briefly stated, the methods employed in the production of animated cartoons include the steps of drawing the characters or objects and then photographing the drawing upon motion picture film. In the production of animated photoplays in colors, the drawings (generally made originally on paper) are transferred onto transparent sheets or cells. The outlines of the drawings are generally shown on one surface of the cell whereas the reverse side is painted with suitable substantially opaque paints so that the finished cell comprises a painting of the character or object. It is well known that the tone of an object changes with the amount of light thrown thereon and as a result the artists are confronted with the problem of correctly depicting the tone of the object on its shaded side in comparison with the tone of the object on the illuminated side thereof. Such shading may be accomplished by changing the tonal quality of the paints applied but this requires very careful application of the paints and is expensive, time-consuming, requires the use of many shades or tones of each color, and is otherwise unsuited for use in the production of photoplays which may require many thousands of individual drawings.

The present invention permits the artists to paint the objects or images on the cells with standard uniform paints irrespective of whether the paint is applied to the illuminated or the shadow side of an object. By means of the process of this invention, another cell is provided, this cell bearing a uniformly colored film of material on portions only of this secondary transparent sheet or cell, this film having outlines determined, in part at least, by the outlines of the pictorial representation which is being depicted whereby the secondary transparent sheet or shadow cell may then be superimposed upon the pictorial representation to impart desired shadings thereto and to modify the tones of the original painting or drawing so that when viewed by the eye or by the camera, a suitable shadow effect is obtained.

An object of the present invention, therefore, is to disclose and provide a method of producing the effects of shadows, depth, tone, change and the like in drawings for use in animated cartoon photography or wherever such effect is desired.

A further object is to provide a simple and relatively inexpensive method of modifying a previously made pictorial representation so as to properly shade the same.

These and other advantages, objects, uses and adaptations of the invention will be readily appreciated by those skilled in the art from the following description of certain illustrative forms of the invention. In order to facilitate understanding, reference will be had to the appended drawings, in which:

Fig. 1 depicts a fanciful drawing of the character ordinarily employed in cartoon production.

Fig. 2 is a shadow cell prepared in accordance with the present invention.

Fig. 3 shows the effect obtained by superimposing the shadow cell upon the drawing of Fig. 1.

Figs. 4, 5 and 6 are enlarged vertical sections through a shadow cell in various stages of preparation.

Since the methods of this invention are particularly of value in the production of photoplays in substantially natural color, the description given hereinafter will be particularly directed to the use of the methods and devices in the production of such colored animated cartoon films. After an original drawing is made, such drawing is traced or transferred onto a sheet of transparent material such as, for example, a sheet of glass, plastic, cellulose derivative, or the like.

Fig. 1 shows a transparency 10 provided with the customary registry openings 11, 12 and 13, such cell carrying a desired pictorial representation, in this case, Mickey Mouse dressed in a robe 14 and shoes 15. The cell also carries a representation of a wooden bucket 16. Since this cell is to be used in the production of a photoplay in colors, the reverse side of the cell is suitably painted, the face and hands being painted with a desired flesh tone whereas the robe 14 is of another color, the shoes 15 of a suitable color and the bucket 16 of another color. The various elements of the cell 10 may be painted a uniform shade or color, for example, the entire outside of the bucket 16 may be of the same color. Obviously, no shading appears in Fig. 1.

A shaded drawing is desired, however, with the light being cast from the left of the picture as shown in Fig. 3, for example. In order to produce the changes in tones which create the effect of shadow, a shadow cell is prepared. A shadow cell preferably comprises a sheet of transparent

material bearing a film of material on one side thereof.

By referring to Fig. 4, which illustrates a cross section through such shadow cell, the transparent base or carrier is indicated at 18 and a suitable film of color-bearing material is indicated at 19. This film 19 should be uniform in its characteristics and whatever color is carried thereby must be homogeneously and uniformly dispersed throughout the film 19. For this reason the entire surface of the shadow cell 18 is covered with the film 19 since this can be done by appropriate coating machinery and thereby eliminate brush marks and other inequalities. The film 19 may well comprise a solution of gelatin, agar agar, or the various vegetable gums such as gum arabic, and the like. The dye or pigment may be uniformly dissolved in the solution or suspended therein. Suspensions of starch in casein, gelatin or gum solutions may be suitably colored. Carbon black or inks may be used in the film 19. A suitable film composition may comprise gelatin, water and glycerine in the proportion of about 1 part of gelatin to 2 parts of water and about 0.2 to 0.4 part of glycerine. Instead of glycerine, other plasticizing agents such as dibutyl phthalate, tricresyl phosphate, or the like, may be employed.

The shadow sheet 18 provided with the uniform color-bearing film 19 is superimposed upon the drawing 10 and a protective coating is applied to desired portions only of the shadow sheet over the color-bearing film 19. During the application of the protective coating, the artist is guided by the outlines of the character depicted on the cell 10. The protective coating is only applied where it is desired to leave the virtually transparent but color-bearing film 19. As a result, the outlines of the protective coating coincide, in part at least, with the outlines of the images carried by the cell 10. For example, it is desired to place a portion of the robe in shadow and therefore the protective coating is applied between the edge 14' and an appropriate part in the front of the image. The edge 14' is indicated in Fig. 2. A shadow of Mickey's head also may be drawn on the back wall and such shadow is generally indicated at 17 in Fig. 2. By referring to Fig. 5, it will be seen that the protective coating is indicated at 20 and 21.

The protective coatings thus applied may be transparent lacquers or other compositions which would be unaffected by solvents for the film 19. It has been found that lacquers made from ethyl cellulose, lactyl resins and ester gums are satisfactory.

After the protective coating has been applied in the manner stated, the shadow cell 18 is treated with a solvent for the unprotected film 19. The solvent removes all of the unprotected film, leaving the homogeneously and uniformly colored film in position on the cell as shown in Fig. 6. If the protective coating is transparent and not colored, then it is not necessary to remove the same. If, however, the protective coating has an undesired coloration, then the cell shown in Fig. 6 is subjected to a secondary bath of a solvent capable of selectively removing the protective coating without affecting the residual color film 19'. Instead of applying the shadow cell 18 over the drawing 10, a separate drawing may be made first, such drawing giving the outline of the areas which are to be covered with shadow and the shadow cell 18 then superimposed over this separate drawing before the protective coatings are applied. This method may be used where the shadow is to extend over a number of elements, some of which appear on separate sheets of Celluloid.

The shadow cell 18 prepared as above described is then placed in superimposed relation to the original cell 10, the composite presenting the appearance shown in Fig. 3. It is to be noted that the shadow (composed of portions of the film 19) is virtually transparent but tones down the coloring of the objects depicted on the cell 10 and in some instances extends over portions of any suitable background which may be positioned behind cell 10. If, for example, the back wall is to be a paneled room, then the portion 17 of the shadow will be cast upon and tone down the coloring of the walls. Ordinarily it has been found desirable to use grays, blues and blue greens as the colors of the shadow cells. The absorption characteristics of the films 19 carried by the shadow cells may vary from 20% to as high as 65%, depending on the general character of the shadow desired.

It is to be noted that the color-bearing film and the protective layer are soluble in selective solvents, the solvent used in removing one of these coatings having no solvent effect on the other coating. In the example given, the color-bearing film may be water-soluble whereas the protective coatings or lacquers are soluble in organic solvents.

If desired, the relationship of the color-bearing film or layer and the protective coating may be reversed. In other words, the shadow cell may be first coated with a lacquer solution containing a dye and the lacquer then protected in spots by means of a water-soluble gummy film. A suitable lacquer may be made by combining 20 grams of ethyl cellulose with 100 grams of an alkyd resin in 600 ml. of a solvent such as trichlorethylene. A very small amount of a plasticizing agent such as a glycolate, may be added. Suitable dyestuffs may be dissolved in this lacquer before it is applied to the transparency.

In the original example given, the color-bearing material was a gummy coating or film and a lacquer was used as a protective coating. In order to visually follow the application of the lacquer, it is sometimes desirable to introduce a fugitive dye into the lacquer, the operator being then capable of observing exactly where he has applied lacquer, the dye being dissipated by subsequent exposure of the cell to sunlight.

When the original color-bearing film is a gelatin or gum, the protective coating may take the form of a bichromate solution containing a fugitive dye, this solution rendering the gelatin insoluble so that when the shadow cell is subjected to a solvent having a selective effect upon the unprotected or untreated gelatin coating, only desired portions of the gelatin are left in contact with the transparent carrier 18.

The method of this invention may be used very effectively not only for shadows but wherever it is desired to produce a localized, substantially transparent but color-bearing film. For example, water effects may be readily produced by introducing shadow sheets made as above described, such shadow sheets carrying very thin films having a blue coloration. If, for example, it is desired to show a fish bowl with a fish swimming therein, the outline of the bowl and the fish may be painted on one cell whereas a shadow cell of a pale blue coloration may be

superimposed upon said drawing for the purpose of toning the coloring of the fish so that when the fish leaps out of the bowl, the coloring will be modified as he moves out of the water. The use of two or three of such superimposed shadow cells may permit suitable gradation of tone as the fish swims toward or away from the observation side of the bowl, the number of sheets positioned between the camera (or observer) and the fish producing a dimming effect as the fish either advances toward or retreats from the observer.

Those skilled in the art will readily understand from the description given that numerous changes, modifications and adaptations of the invention may be made. All changes coming within the scope of the appended claims are embraced thereby.

I claim:

1. A method of producing shadow effects and the like in animated cartoons, which comprises: superimposing a sheet of transparent material carrying a uniform color-bearing, light transmitting film thereon over a pictorial representation to be photographed, applying a substantially transparent protective coating to desired portions only of said sheet to cover said color-bearing film, said protective coating being applied in accordance with the pictorial representations therebelow, then removing the unprotected color-bearing film while retaining the protected remaining color-bearing film, superimposing the treated sheet over the pictorial representation, and photographing the treated sheet and pictorial representation while in superimposed relation.

2. A method of producing shadow effects and the like in animated cartoons, which comprises: applying a color-bearing composition to one surface of one sheet of transparent material to form a uniform colored film thereon, said film permitting the passage of light therethrough; applying a substantially transparent protective coating to desired portions only of said color-bearing film; removing uncoated colored film from said sheet material by means of a solvent having a selective solvent action upon said uncoated colored film; and superimposing the treated sheet over a pictorial representation and photographing said treated sheet and pictorial representation while in superimposed relation, the colored film carried by said treated sheet imparting a desired shading to desired areas of said pictorial representation.

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