United States Patent

Fukui

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[45] **Aug. 15, 1972**

[54] **AUTOMATIC IMAGE SHIFTING DEVICE**

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[21] Appl. No.: **54,783**

[52] **U.S. Cl.** **40/36,** 40/65, 40/137, 352/81

[51] **Int. Cl.**.....**G09f 11/30,** G09f 7/00

[58] **Field of Search**.....353/30, 32, 38, 25; 95/1 R; 352/81; 40/106.51, 106.52, 36, 65, 137

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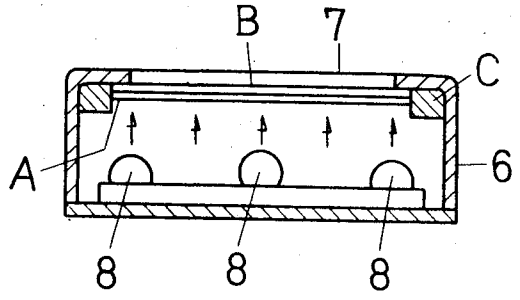
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Assistant Examiner—Steven L. Stephan
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[57] **ABSTRACT**

This invention relates to an automatic image shifting device of the construction in which a picture plate and a sectioning plate are superposed, said picture plate being a single film sheet on which several kinds of images sectioned into strips each having a specified width are printed, said sectioning plate being adapted to transmit only the strip portions of the same kind of pictures by shielding a part of said picture plate, said two plates superposed are relatively displaced at an interval of specified time to thereby project several independent pictures alternately into an image by a suitable light source.

1 Claim, 10 Drawing Figures



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FIG. 1

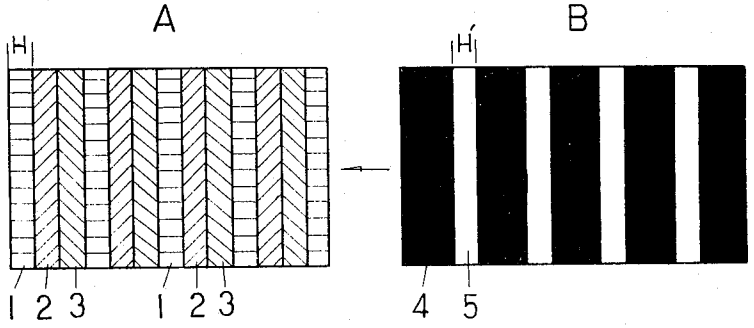


FIG. 2

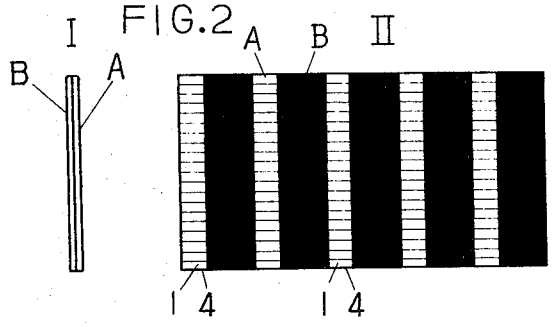


FIG. 3

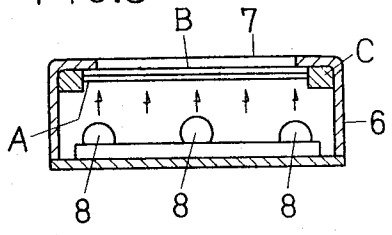


FIG. 4

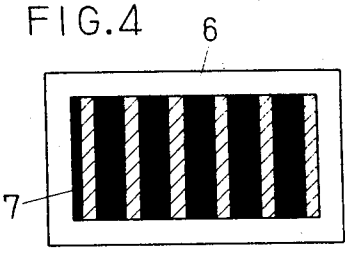


FIG. 8

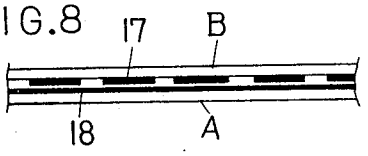


FIG. 10

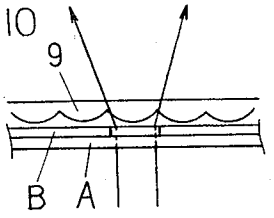
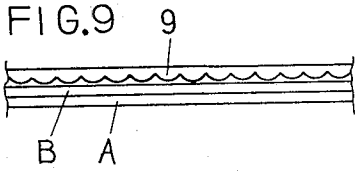


FIG. 9



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FIG. 5

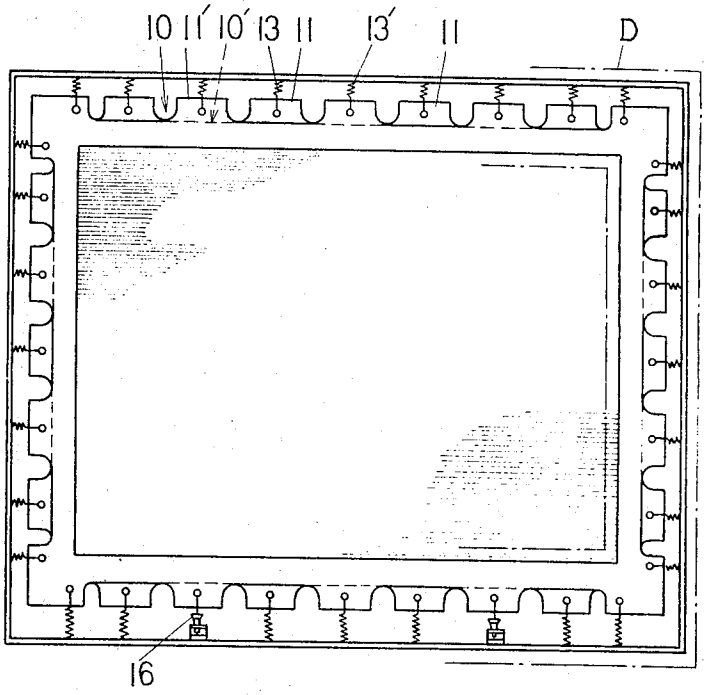


FIG. 6

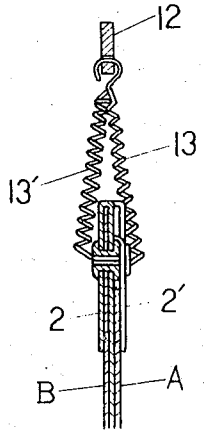
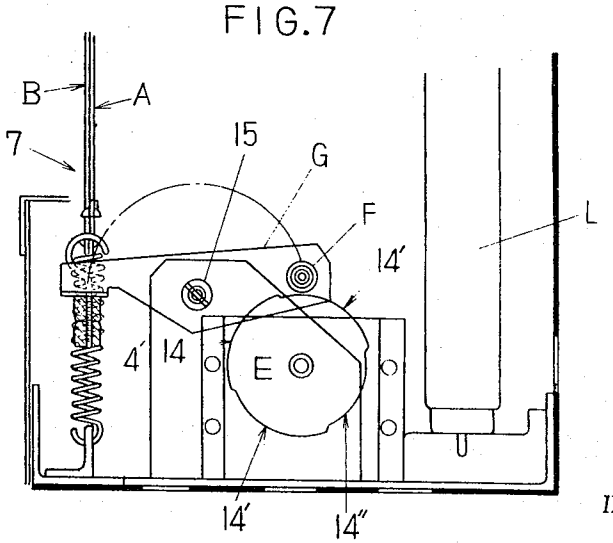


FIG. 7



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AUTOMATIC IMAGE SHIFTING DEVICE

This invention relates to an automatic image shifting device for use chiefly in a propaganda campaign, and its principal object is to produce several kinds of change in an image at an interval of specified time to draw attention of viewers to the image and thereby to enhance desired propaganda effects, and it is also an important object of the invention to provide a device of the character described which is not only simple in structure and positive in operation but also can be manufactured at relatively low cost.

Preferred embodiments of this invention are shown in the accompanying drawings in which FIGS. 1 through 5 schematically explain the invention:

FIG. 1 shows an image producing body used in the device of the invention with a view A designates as a picture plate and a view B designates as a sectioning plate;

FIG. 2 similarly shows the structure of the image producing body, with a front view of the body designated by 1 and a side view by II;

FIG. 3 shows the entire device in its longitudinal section near the center thereof; and

FIG. 4 similarly shows the entire device in front elevation;

FIGS. 5 through 7 show the device of the invention in its practical application, with FIG. 6 shown in front elevation, in which:

FIG. 6 is a fragmentary enlarged detailed view showing a relationship between the sectioning plate and the picture plate; and

FIG. 7 is a fragmentary enlarged sectional view showing a displacement mechanism for the picture plate;

FIGS. 8 through 10 schematically shows another embodiment of this invention in which:

FIG. 8 is a plan view showing a contacting means for the image producing body;

FIG. 9 is a plan view showing a means for causing a sectioned picture surface to hold continuity; and

FIG. 10 is similar to FIG. 9 but is a partly enlarged plan view.

A projecting display device conventionally used in advertisement and the like activities is designed to project a single image by the use of a single film picture plate. In order to produce various changes in the image, the same number of picture plates as the number of the intended image is not only required but a mechanism for feeding the picture to its required position in good order and various other means are required, with the result that the projecting display device in conventional use is not free from various disadvantages such an increase in the size of the entire device, an increase in expenses due to growing complicatedness in structure, frequent failures in function or the like.

This invention is intended to eradicate the disadvantages of the kind described and is directed toward the provision of a novel device in which several kinds of complete images are sectioned into the respective strips of specified widths, a picture plate A having the images thus sectioned printed successively on a single film sheet is laid over a sectioning plate B adapted to transmit only the strip portions of the same kind of images by shielding a part of the picture plate, the picture plate A and the sectioning plate B thus superposed are caused to be displaced relatively at an interval of specified time and thus several respectively independent pictures are alternately projected into an image.

A description will be made of preferred embodiments of the invention with reference to the drawings.

Referring now to the diagrammatic views shown in FIGS. 1 through 5, the character A in the figures designates a single film picture plate having several kinds of images 1, 2 and 3 divided into lines, namely bands of narrow widths printed thereon according to specified order and procedures.

Namely, the images 1, 2 and 3 are made in the manner that a single complete picture is divided into strips each having a specified width and said each strip is selectively printed according to specified order and process. For example, printing of the picture plate is made in the manner that one complete picture is made in the same size as the film picture plate A and is sectioned into strips, each of said strips is selected at a space of every second or third strip and is printed on the picture plate A with the width of space therebetween maintained without change, and other second and third sectioned strips of picture are also printed on the spaces thus maintained blank without change according to the specified order and process, whereby a single sheet of picture plate is formed of assembled strips of picture. By reducing the space between the strips in a substantial degree, a picture of high density can be projected into an image. The character B is a sectioning plate, which is designed to select only the same kind of strips of picture by shielding a part of the picture plate A on which several kinds of pictures in the form of strips are printed as described above, and which has a transparent portion 5 and a shielding portion 4 formed in a striplike manner thereon. And the width H' of the transparent portion 5 is equal to one frame of each strip picture printed in a striplike manner on the picture plate A, for example, to the width H of a picture 1, and the shielding portion 4 is of a width sufficient to shield the other strip pictures 2 and 3 completely and is smeared out with a black or other dark color.

FIG. 2 shows the state in which the picture plate A and the sectioning plate B are superposed, and in which the same kinds of pictures 1 sectioned by the transparent portion 5 are rendered visible and the other pictures 2, 3 are completely shielded by the sectioning plate B by positioning the sectioning plate B in a specified position. When the sectioning plate B is moved to a specified amount of space, the shielding portion 4 and the transparent portion 5 are changed in position whereby the other pictures are rendered visible by the transparent portion 5, to introduce a change in the projected image. When in this connection the width of each space is reduced in a substantial degree, the picture 1 and the next picture 1 in View II of FIG. 2 approach each other, and accordingly one complete picture is projected by suitably selected strip pictures. When the sectioning plate B is used in printing each picture striplikely on the picture plate A, only the necessary portion of one complete picture is striplikely printed and any desired picture can striplikely be received on one sheet of picture plate A by changing the shielding portion 4 (by moving the sectioning plate B) and printing the next picture through the transparent portion 5 on the unprinted portion of the picture

plate. The capacity of one picture plate to receive the number of pictures in this case is 3 – 8 pictures as a standard, and it is considered suitable to maintain the width of a strip on the order of 0.8 mm.

FIG. 3 shows an image producing device comprising the picture plate A and the sectioning plate B. A framework 6 is provided on one side with a screen window 7, and the window is provided with the sectioning plate B and the picture plate A superposed, said both plates being designed to be shifted relatively by a displacement mechanism C and is provided rearwardly of the plates A and B with light source means 8.

One displacement mechanism C is adapted to displace the picture plate A selectively with respect to the sectioning plate B in the direction at right angles with the longitudinal direction of the length of the strip picture surface, and accordingly when the strip picture surface is printed in its longitudinal direction, the plate A is displaced transversely and when the strip picture surface is printed in its transverse direction, the plate A is to be moved in its longitudinal direction.

Accordingly, when light is emitted by the operation of the light source means 8, part of the light is completely shielded by the shielding portion 4 of the sectioning plate B and the light that passed through the transparent portion 5 projects only the specified strip pictures into an image of one complete picture. The displacement mechanism C operates after a certain lapse of time, displaces the sectioning plate B by a specified distance to bring the transparent portion into agreement with other strip picture surface 2 or 3 and to produce a change in images.

Incidentally, as there is a limit in the resolving power of the human eyes, not only the sectioned picture images provide nothing objectionable in being viewed as one complete picture but also the black lines on the shielding portion 4 offer no interference.

Furthermore, the structure shown in FIG. 9 makes it possible to impart continuity to the sectioned picture surface by disposing a divergent lens 9 for example a convex lens on each strip in front of the picture plate A and sectioning plate B superposed and by diffusing a beam of light at a specified angle of reference as shown in FIG. 10.

Also, FIG. 8 shows a structure in which the picture plate A and sectioning plate B are superposed on paint coated portions 17, 18. The structure makes it possible to superpose both plates A and B completely on the surfaces of these coated portions irrespective of the thicknesses of the plate A and B.

Next, FIGS. 5 through 7 show in detail a superposing mechanism for the picture plate A and sectioning plate B in the case of practical use of this device and a displacement mechanism for displacing both plates relatively.

Namely, in the embodiment shown, by forming substantially arcuate notches 10, 10'' so as not to superpose each other on the reinforcing edges respectively formed on the circumferences of the picture surface A, in which several kinds of complete images are sectioned into strips each having a specified width and the complete images thus sectioned are printed on one sheet of film in order of 1, 2 and 3, and of the sectioning plate B including the shielding portion 4 smeared out with a black or other rich color in order to transmit only the same kind of strip portions by shielding a part of said picture plate and the transparent portion 5, and by connecting unnotched portions 11, 11' by springs 13, 13' to the four side walls of a square frame 12, said both plates A and B are brought into contact with each other as closely as possible, and, in the state thus brought about, the picture plate A is moved by the displacement mechanism, and several kinds of strip images 1, 2 and 3 in the picture plate are alternately projected by the light source means.

Referring further in detail to the mechanism in conjunction with the figures, a square frame 12 is fixed to the side of a screen window 7 provided in front of a framework D and inside the square frame 12 are disposed in a state of tension the picture plate A and sectioning plate B with the plate B faced outside. Namely, the plates A and B are connected on the unnotched portions 11 and 11' of the reinforcing edges of soft plastic resin material fringing the circumferences of the plates to the inner circumference of said square frame 12 by the respective springs 13 and 13', and are always in tension by being urged to the square frame. And both plates, as shown in FIG. 5, are staggered with respect to each other on the notched and unnotched portions on the respective reinforcing edges, and moreover the reinforcing edges 11, and 11' of both plates are connected by the respective springs 13, 13' to the square frame 12 along the same axial line on the inner circumference of the frame 12, and accordingly the plates are substantially in contact with each other with no gap left therebetween, with the result that the image produced is very clear.

Reference will be made now to the displacement mechanism of both plates A and B. As shown in FIG. 7, a cam E is brought into contact with a small roller F provided at the other end of an oscillating rod G to which one end of the reinforcing edge 11 of the picture plate A is connected, said cam being formed on the outer circumference with several steps 14, 14', 14'' varying in diameter of the cam in accordance with the width of each strip picture surface 1, 2 and 3.

Accordingly, the oscillating rod G produces oscillation with a fulcrum 13 as an axis by the rotation of the cam E through the small roller F attached to the oscillating rod G, whereby, depending upon which one of the steps 14, 14' and 14'' the diameter of the cam with which the small roller F is brought into contact in oscillation corresponds to, the picture plate A responds to the corresponding diameter and length, and resists the tension of the spring 13 at one instant and is at other instant displaced in cooperation with the tension of the spring 13 at a distance and in a period of time corresponding to said diameter and length.

In addition thereto, as the picture plate is always in contact with the sectioning plate B while in process of displacement, there is no difference in sharpness of image.

Incidentally, the position of said sectioning plate B must always be fixed, but the position may be adjusted to a certain degree by adjusting screws 16 provided below the reinforcing edges 11'. The character L in the figure designates a fluorescent lamp mounted behind the sectioning plate B inside an outer frame D.

I claim for patent:

1. An automatic image shifting device characterized in that a picture plate and a sectioning plate are superposed, said picture plate being a single film sheet on which several independent complete pictures sectioned into strips are successively printed, said sectioning plate being adapted to transmit only the strips of one of the pictures by shielding a part of the picture plate, said picture plate and said sectioning plate being relatively displaced at an interval of specified time, said strips each having a specified width, the picture plate being a sheet of film on which said pictures thus sectioned are printed in regular order, the sectioning plate having shielding portions and transparent portions, said shielding portions being substantially opaque so as to transmit only images of strips of said picture plate aligned with said transparent portions of said sectioning plate, the two plates being provided with reinforced peripheral edges respectively formed with notches with the notches of one of said plates out of line with the notches of the other of said plates, a frame surrounding said peripheral edges of said plates, and spring means connected to unnotched portions of said peripheral edges of said plates and to said frame for placing said plates in close contact, and displacing means operatively engaging one of said plates for shifting the latter with respect to the other, and light source means coacting with said plates for showing several respectively independent pictures alternately.

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