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Gordon

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[54] **METHOD AND DEVICE FOR CREATING AN ILLUSION OF THICKNESS FROM A FLAT IMAGE**

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[51] **Int. Cl.**[7] **G09F 13/32**

[52] **U.S. Cl.** **40/433**; 40/577

[58] **Field of Search** 40/433, 431, 435, 40/474, 473, 495, 577, 579, 580

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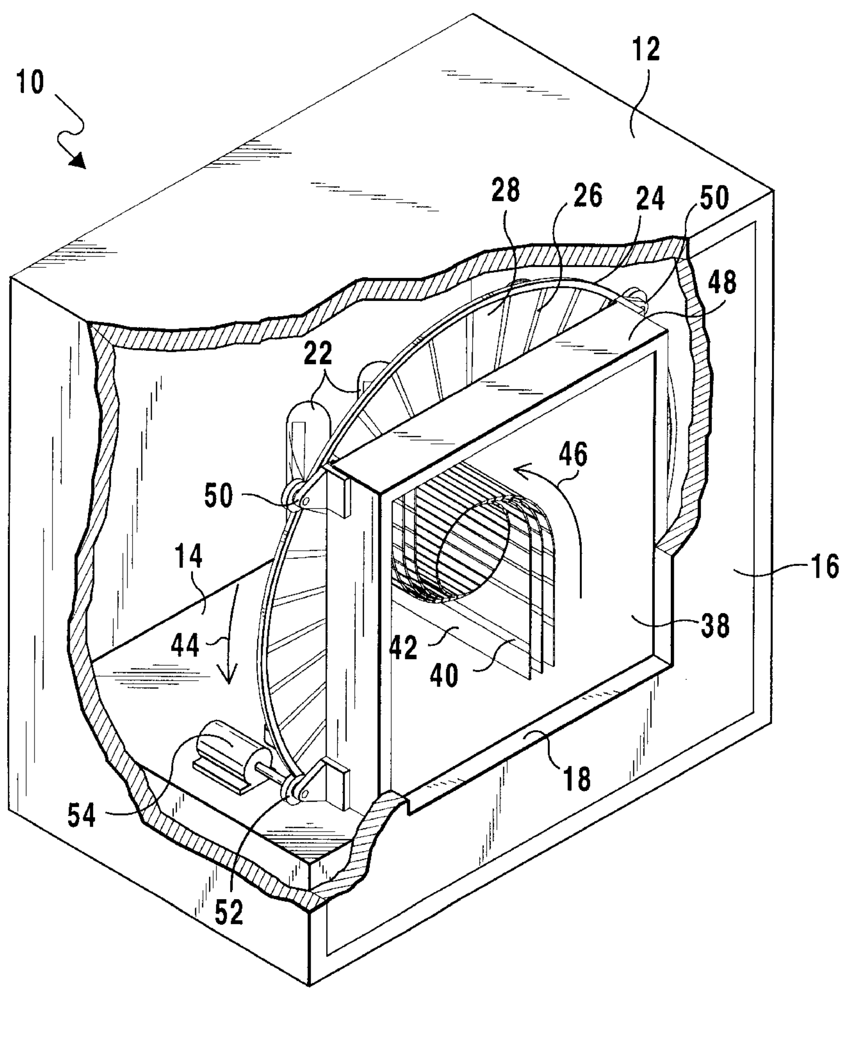
Primary Examiner—Cassandra H. Davis

Attorney, Agent, or Firm—Michael I. Kroll

[57] **ABSTRACT**

A method and apparatus for producing an illusion of depth from a flat image. The apparatus includes a plurality of sheets, each being at least partially transparent and reflective and a light source. A design media having at least one of relatively thin linear and curvilinear design elements cut therein is positioned between the plurality of sheets and the light source. A frame is provided for holding the plurality of sheets therein and forms a slot therebehind for holding the design media. When the light source is illuminated an illusion of depth is produced for the at least one of relatively thin linear and curvilinear design elements cut into the design media. A display media including a plurality of color sectors separated by a plurality of sector lines is rotatably positioned between the design media and the light source. The addition of the display media cooperates with the design media to create the appearance of a series of continually undulating colorful surface segments moving along the path of the original design, changing color and length as they move inward toward the center of the display or outward depending on the direction of rotation of the display media.

16 Claims, 12 Drawing Sheets



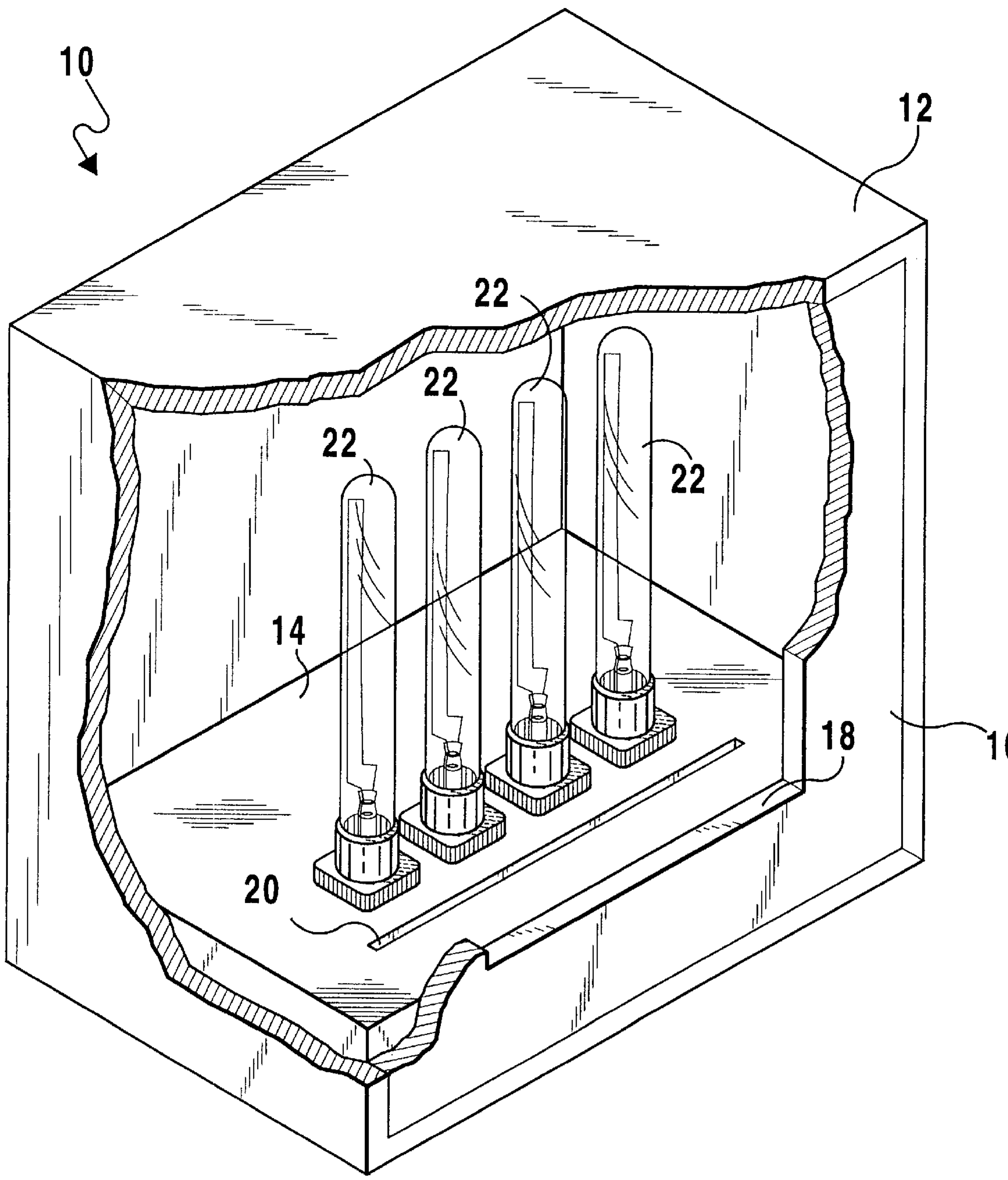


FIG 1

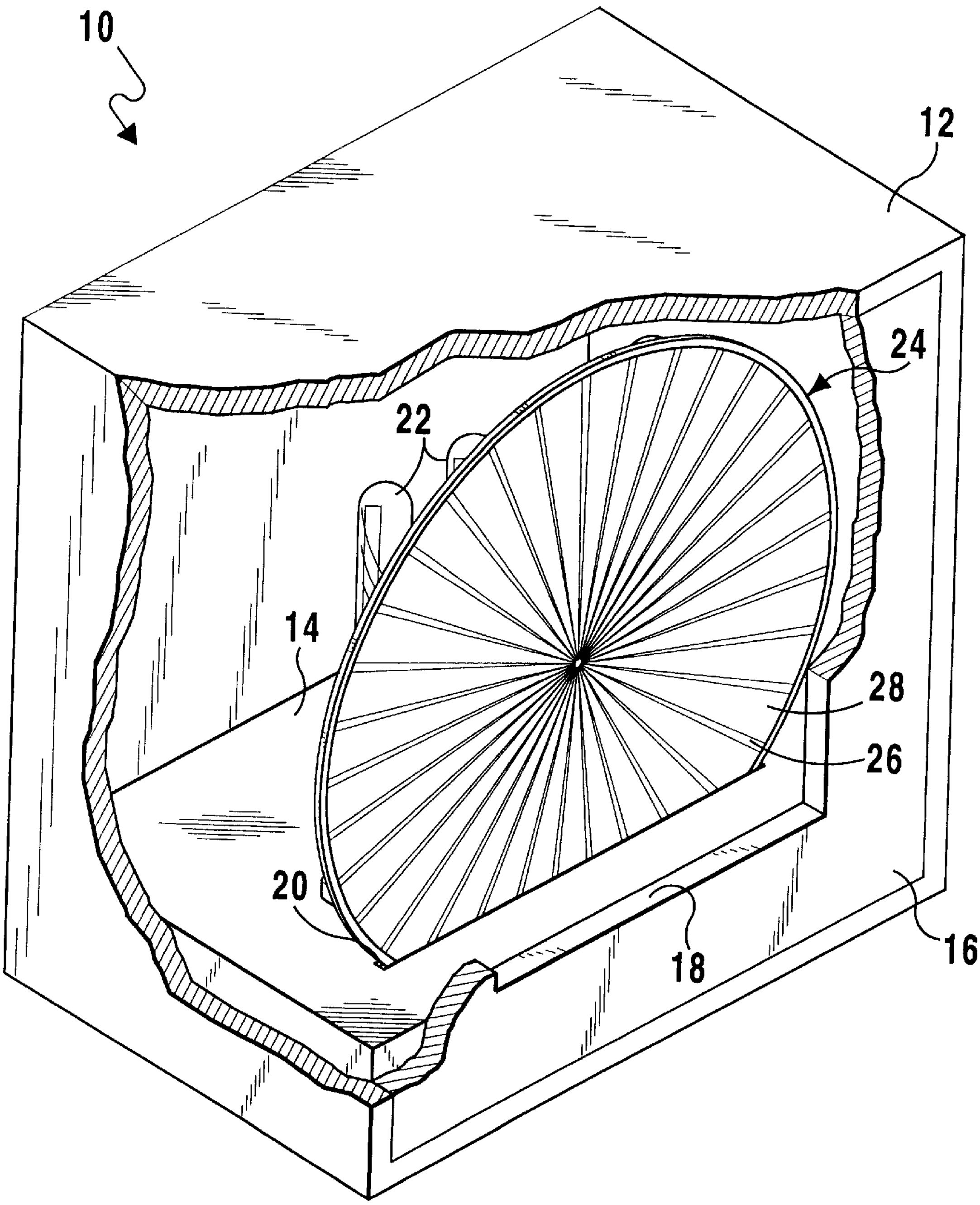


FIG 2

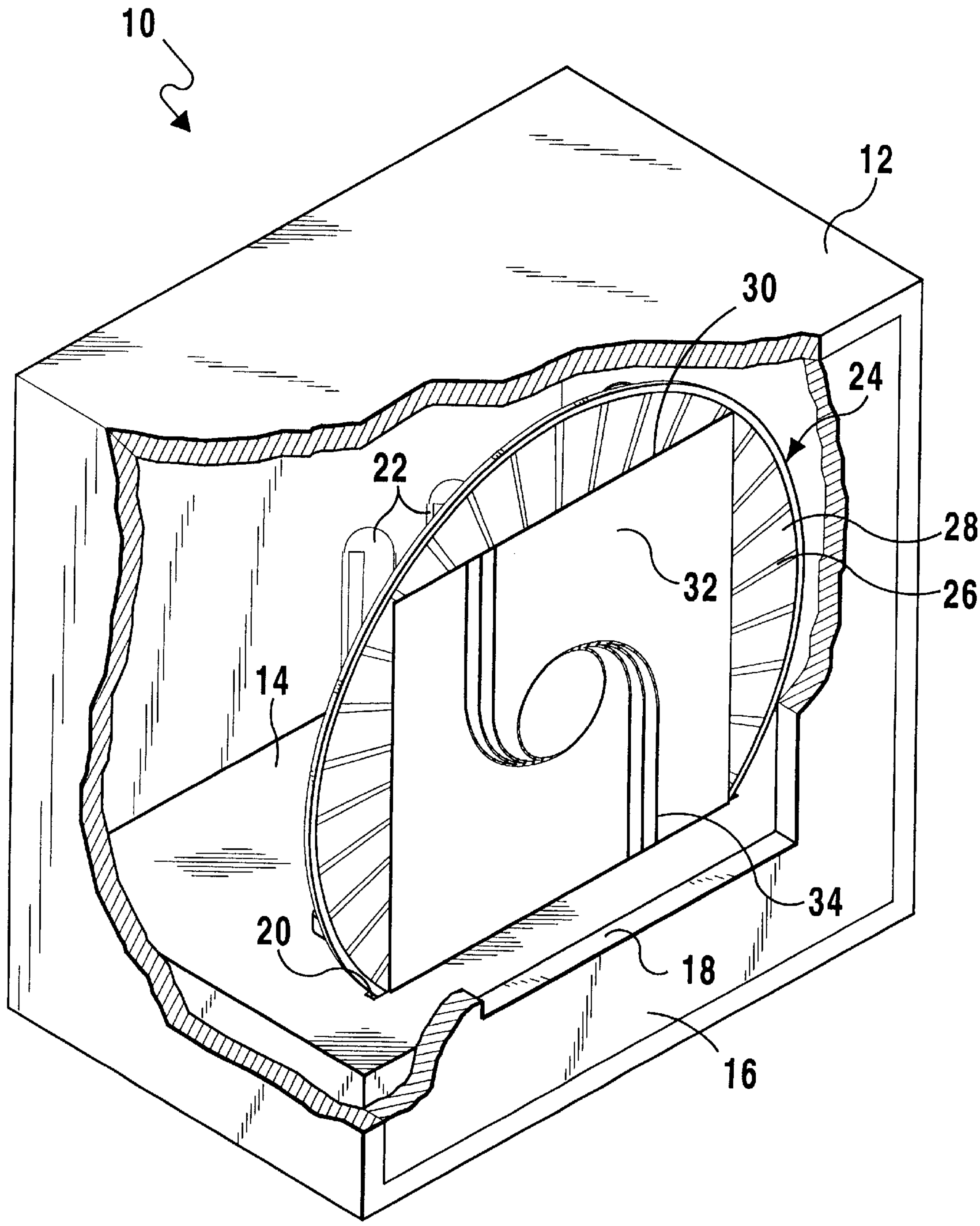


FIG 3

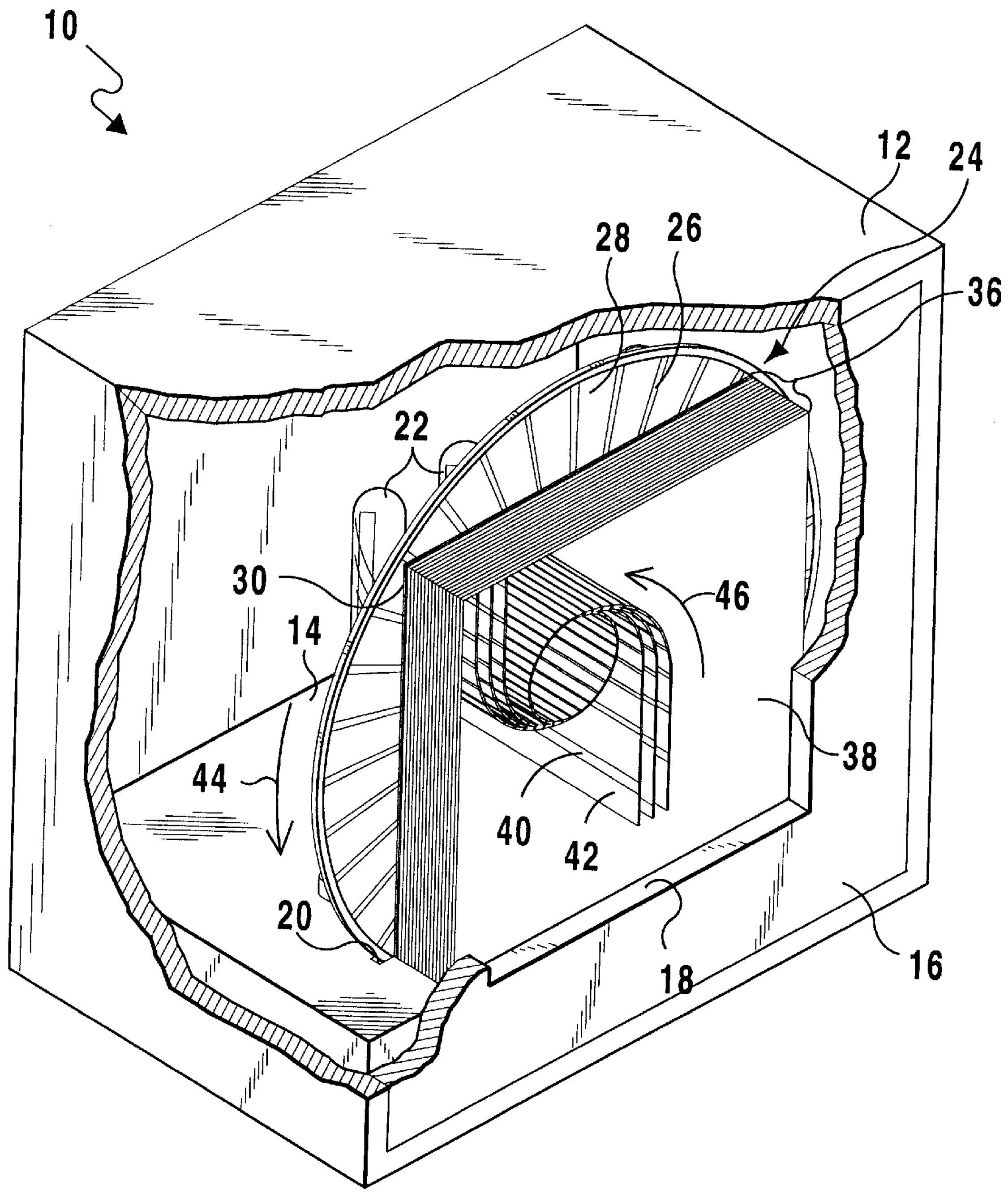


FIG 4

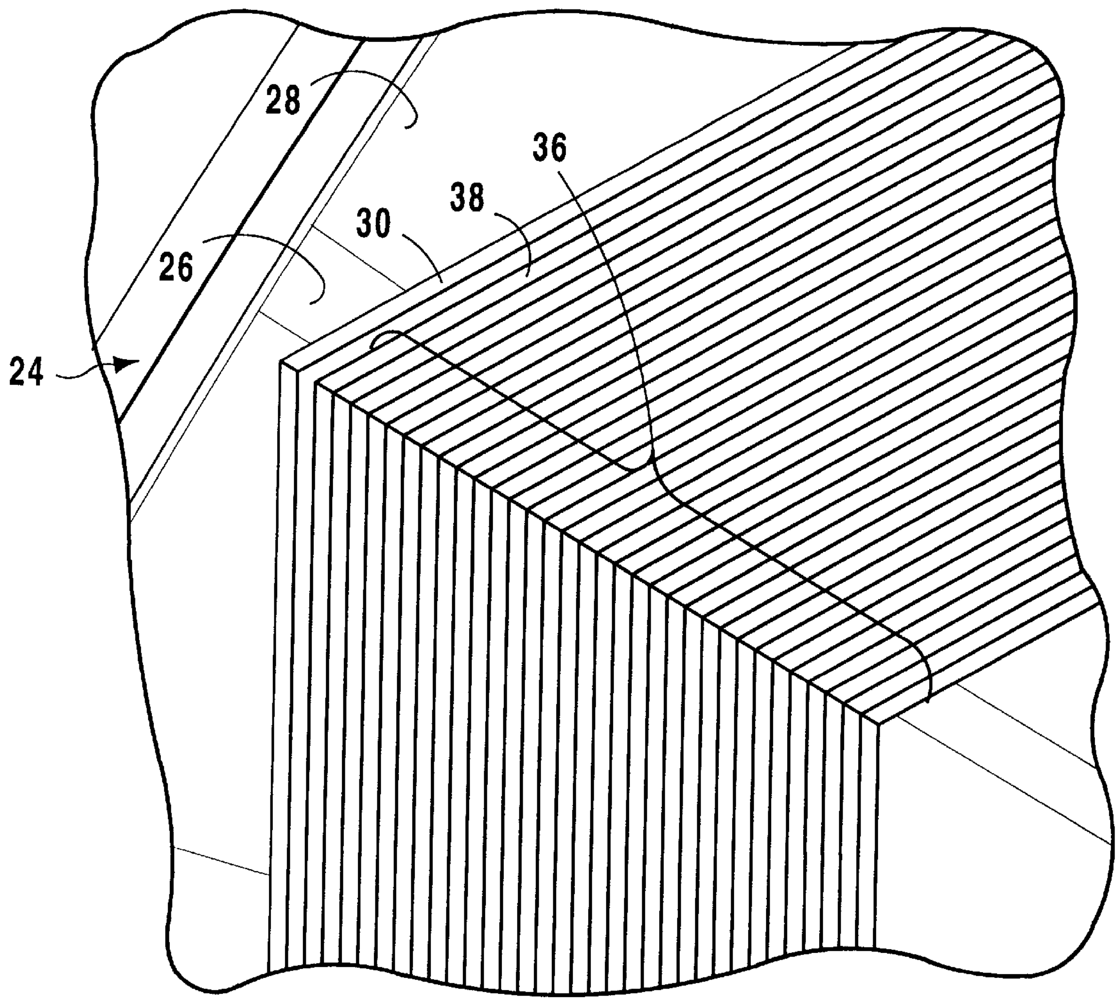


FIG 5

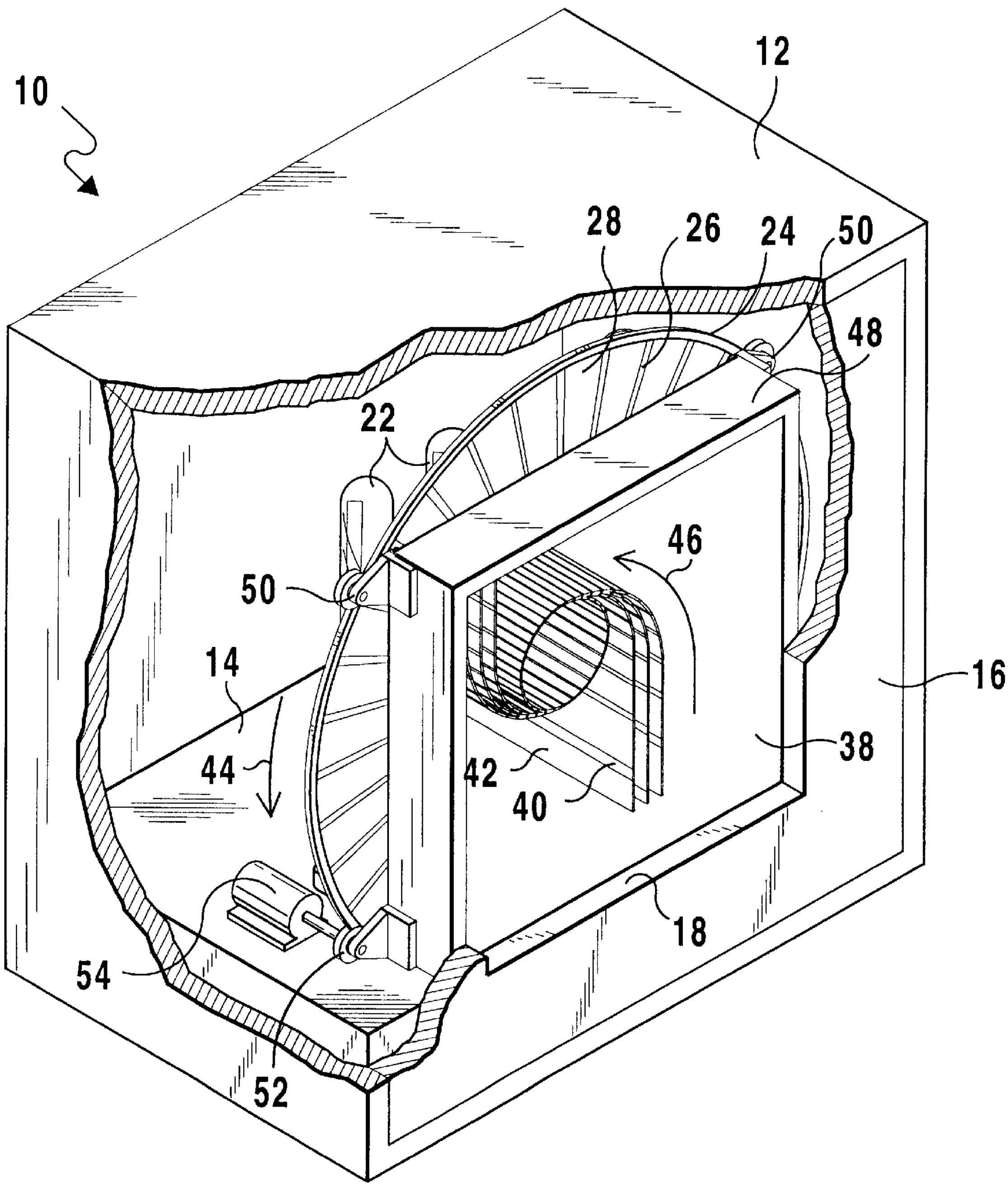


FIG 6

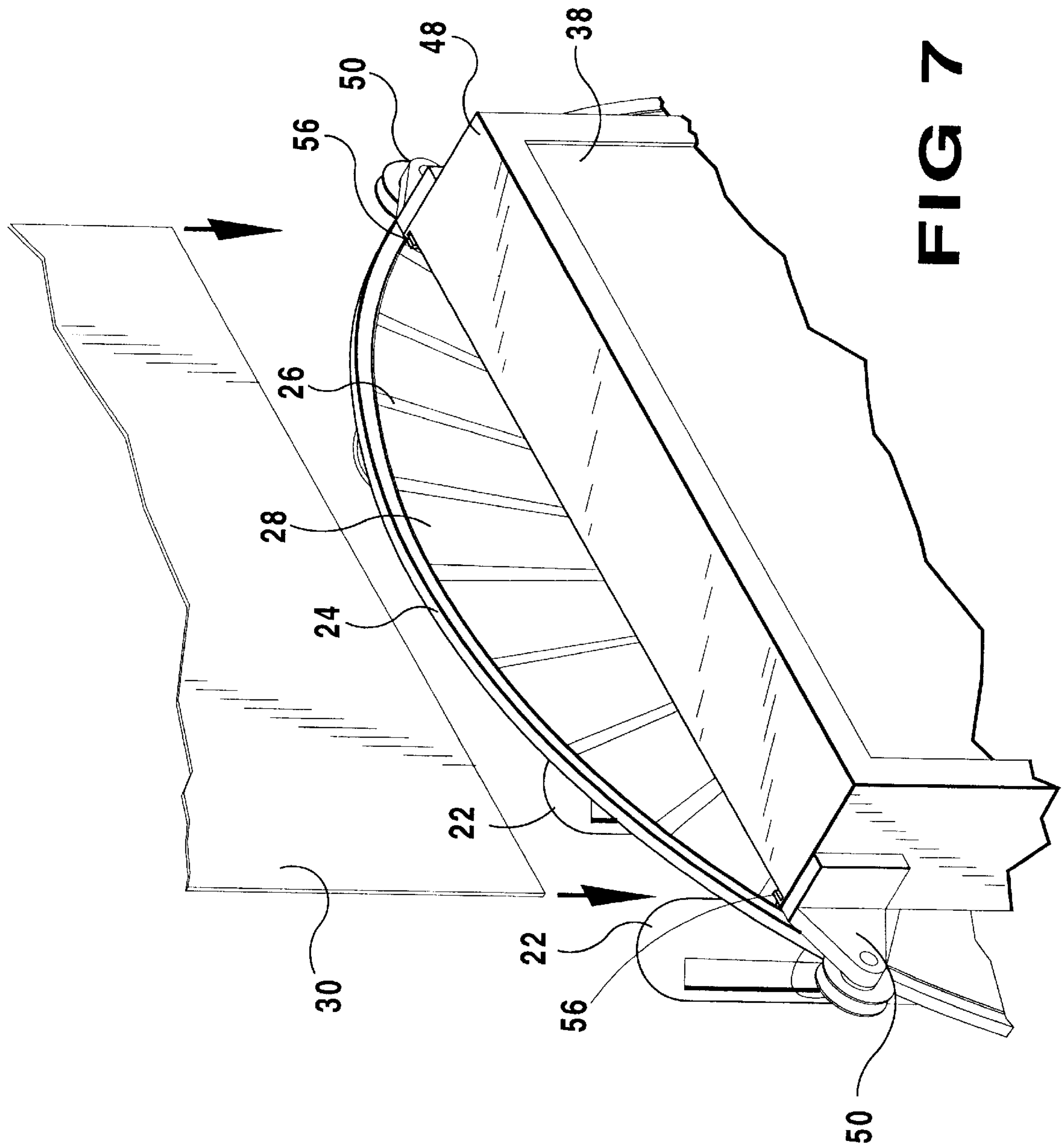


FIG 7

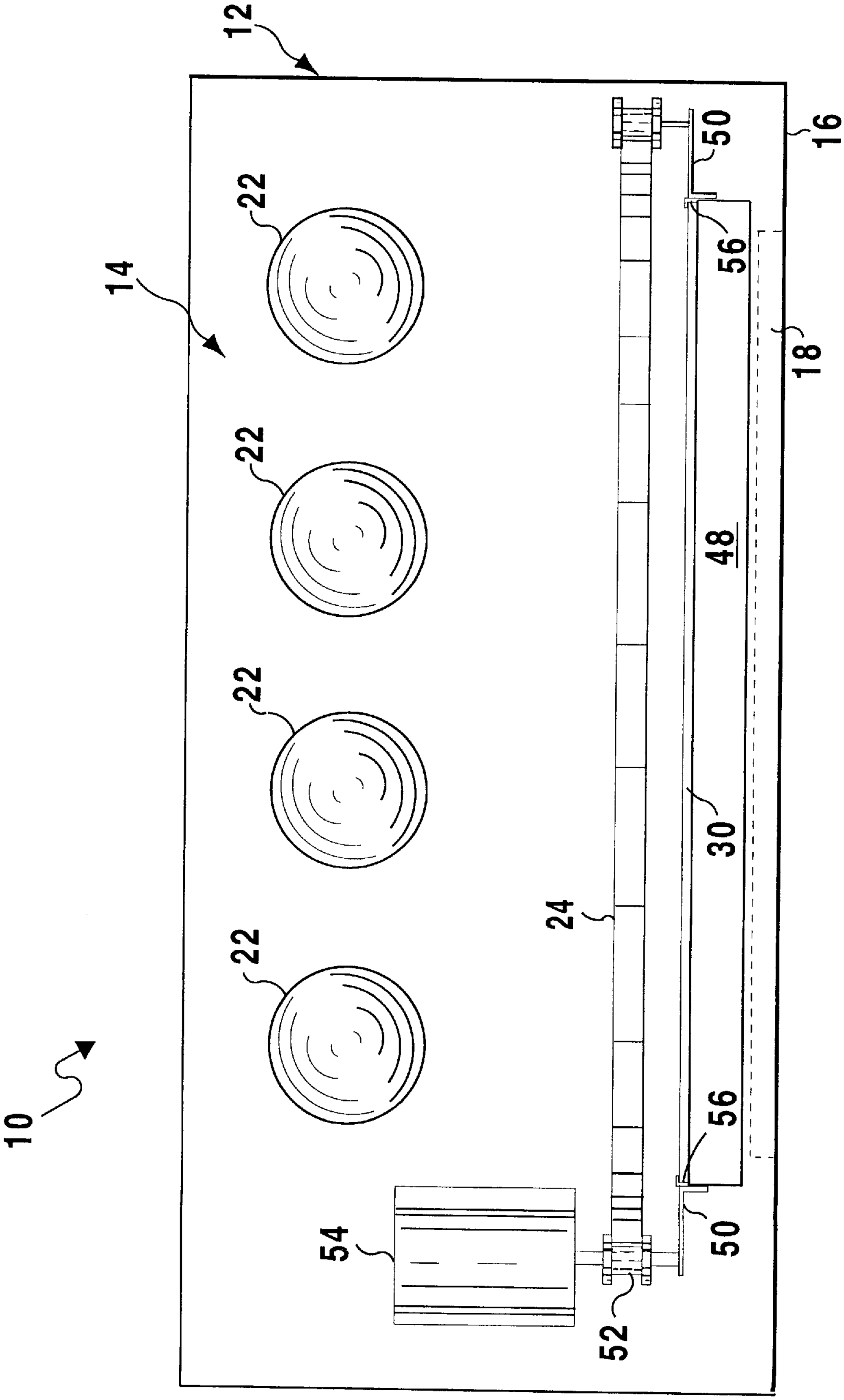


FIG 8

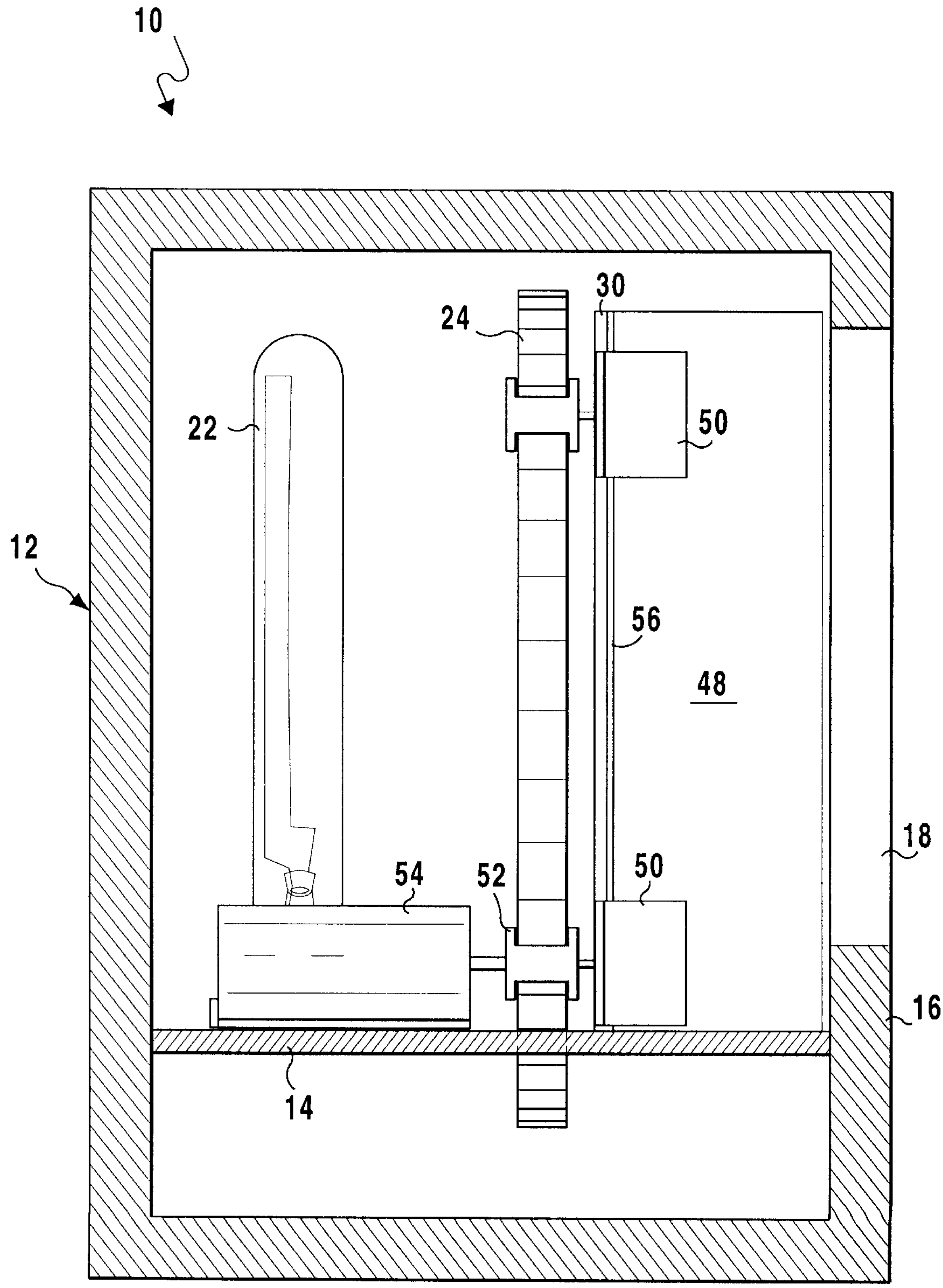
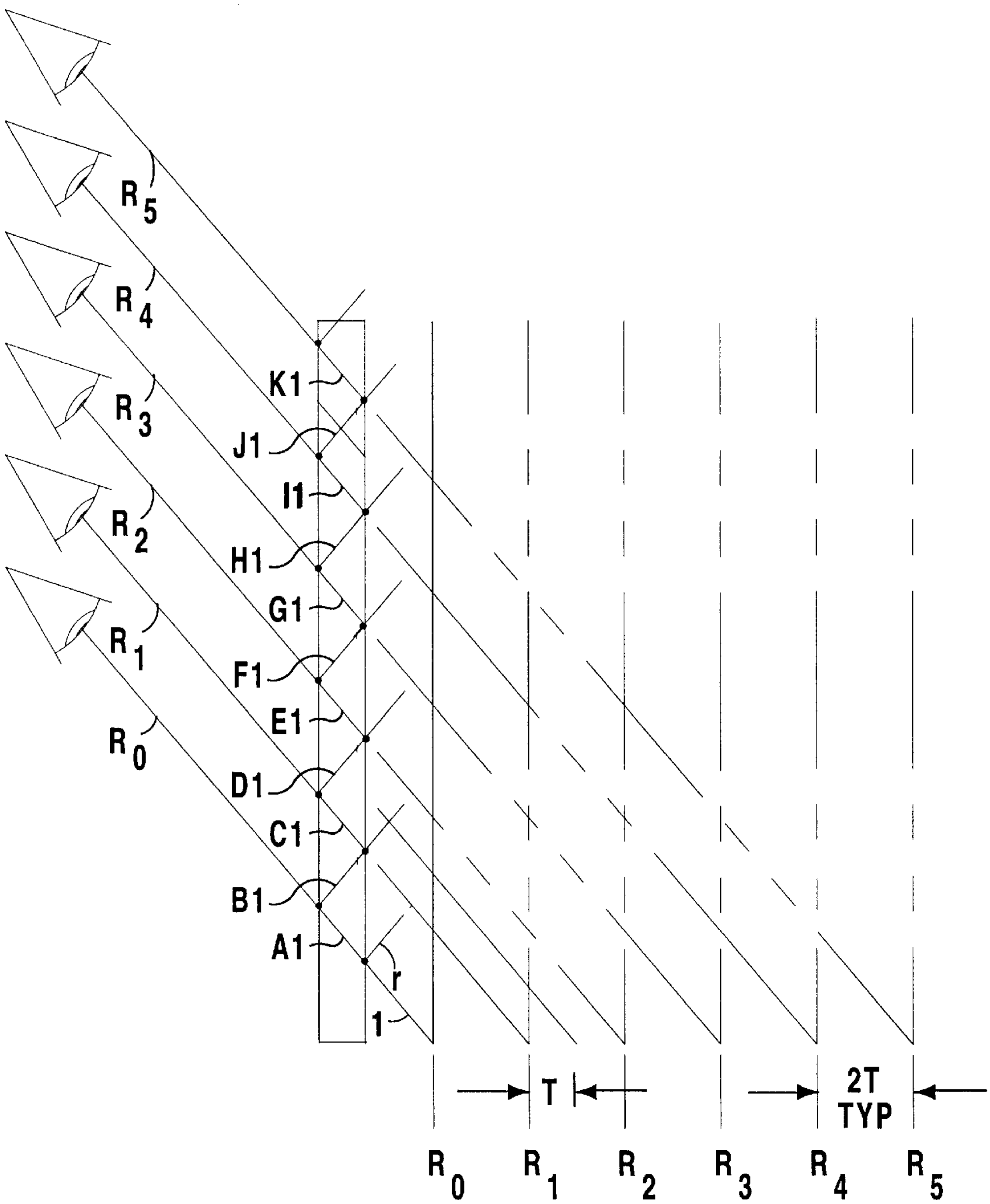


FIG 9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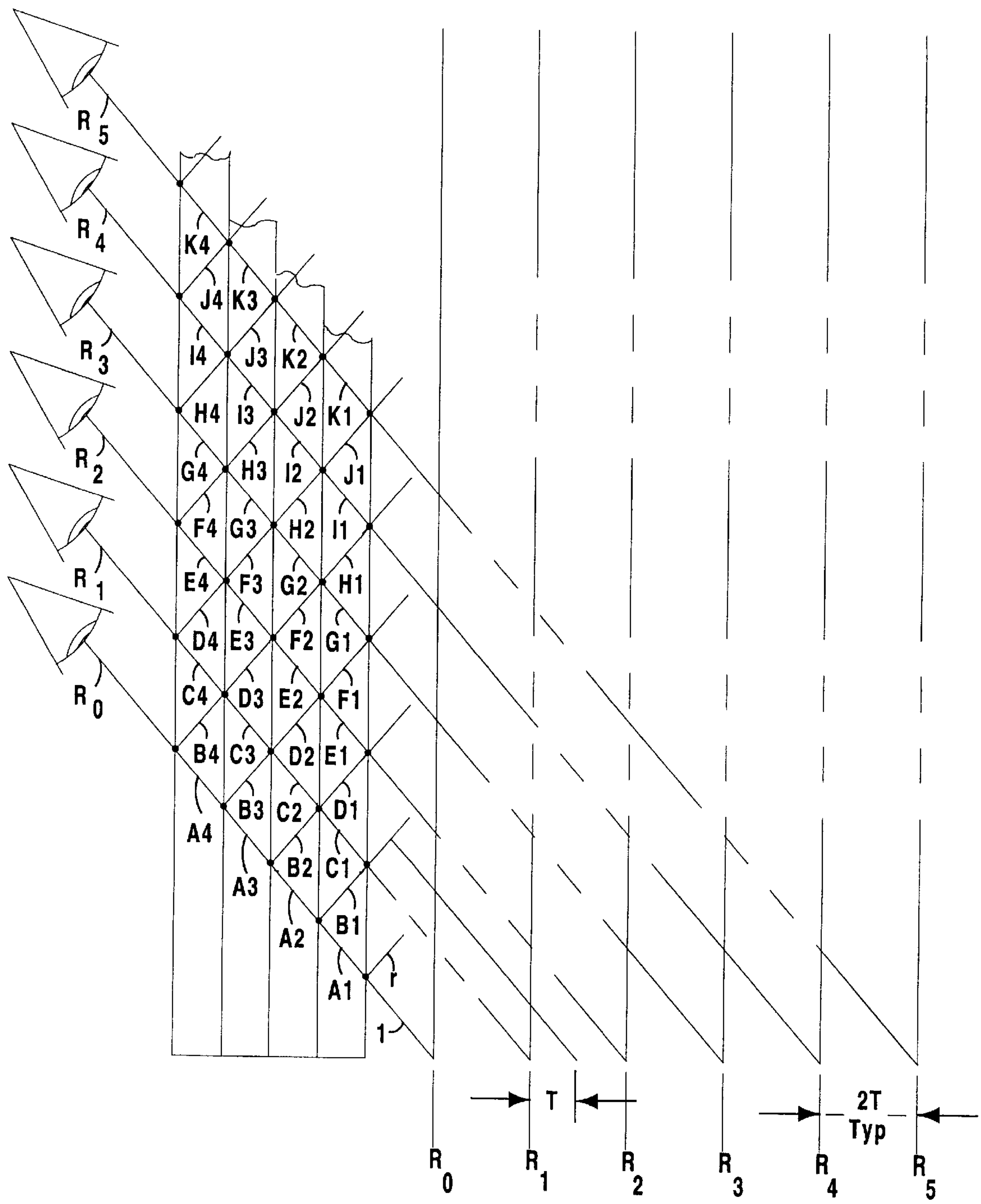
R4
R3
R2
R1
R0
K1
J1
I1
H1
G1
F1
E1
D1
C1
B1
A1
r
1
T
2T
TYP
R0
R1
R2
R3
R4
R5

FIG 10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R3
R2
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R0
K4
J4
K3
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J3
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G4
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F1
B4
C3
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E1
A4
B3
C2
D1
A3
B2
C1
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r
1
T
2T
Typ
R0
R1
R2
R3
R4
R5

FIG 11

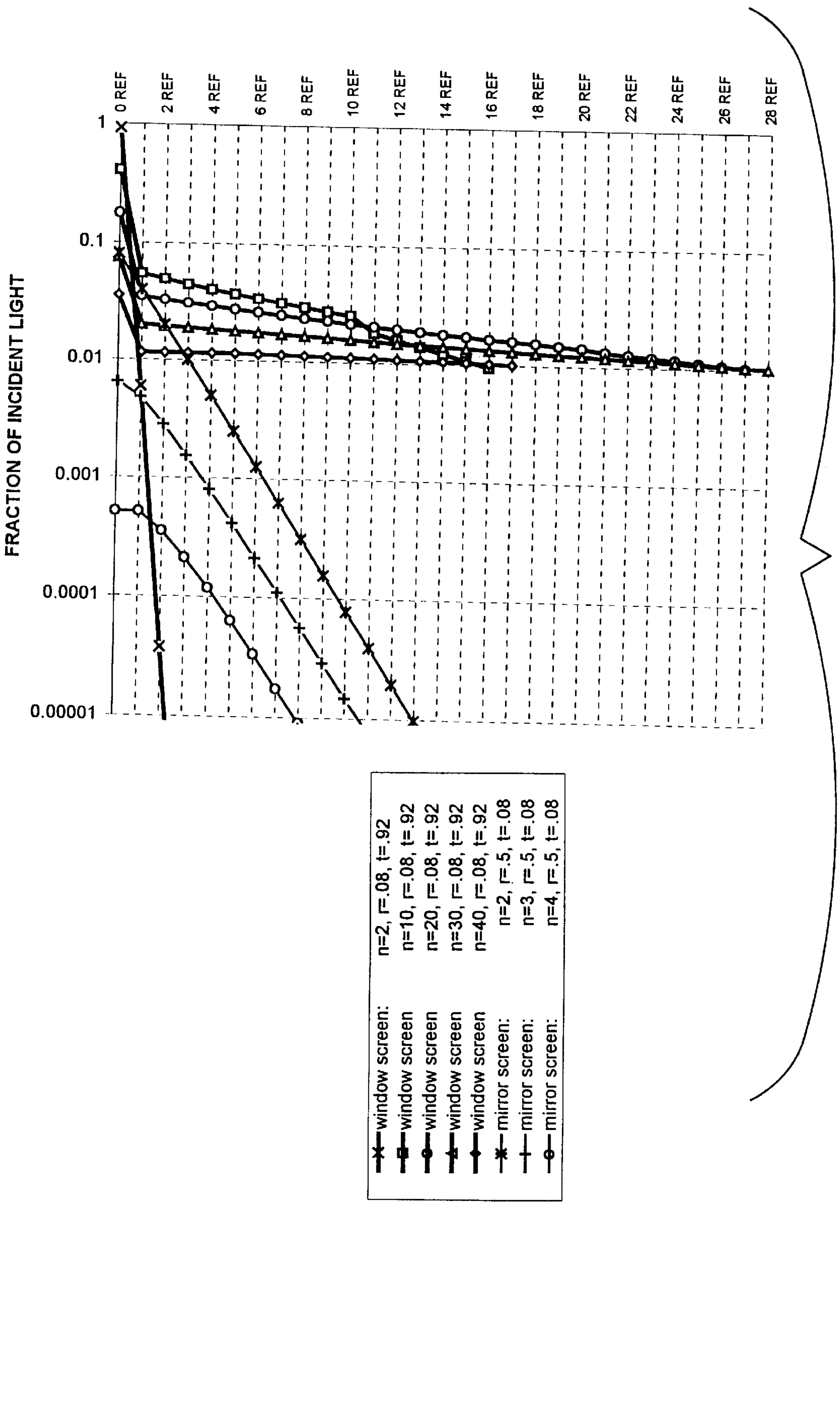
FRACTION OF INCIDENT LIGHT
1
0.1
0.01
0.001
0.0001
0.00001
0 REF
2 REF
4 REF
6 REF
8 REF
10 REF
12 REF
14 REF
16 REF
18 REF
20 REF
22 REF
24 REF
26 REF
28 REF
window screen: n=2, r=.08, t=.92
window screen n=10, r=.08, t=.92
window screen n=20, r=.08, t=.92
window screen n=30, r=.08, t=.92
window screen n=40, r=.08, t=.92
mirror screen: n=2, r=.5, t=.08
mirror screen: n=3, r=.5, t=.08
mirror screen: n=4, r=.5, t=.08

FIG 12

METHOD AND DEVICE FOR CREATING AN ILLUSION OF THICKNESS FROM A FLAT IMAGE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates in general to a method and device for producing a special effect and, more specifically, to a method of producing an illusion of thickness from a flat image viewable with the unaided eye and a device for producing an animated presentation viewable with the unaided eye having an illusion of thickness from the flat image.

2. Description of the Prior Art

Numerous methods and devices for creating an illusion of thickness have been provided in the prior art. For example, one such method and device known popularly as the "infinity mirror" may be used to create an illusion of thickness. This device includes a full mirror having a reflectance approaching 100%, and a partially silvered or transparent mirror having a reflectance of approximately 50% and a transparency as low as 8%. The two mirrors are positioned to extend substantially parallel and spaced from each other to form a gap therebetween. The reflective sides of the two mirrors are also positioned to face each other. When an observer views an illuminated display positioned between the two mirrors through the transparent mirror, an array of singular reflections is observed, separated by equal gaps, which recede and fade away from both the original image and the observer into the depth of the field of view.

In the case of the "infinity mirror", the traditional two mirror arrangement yields a maximum number of visible reflections possible for the type of material used, i.e. adding additional partially reflective surfaces decreases the number of visible reflections produced. This is evident from the graphical representation of FIG. **12**. The relatively low transparency/reflectivity ratio of transparent mirrors leaves little light beyond the first reflection for distribution to other reflections thus reducing the ability to produce additional reflections.

Raising the transparency/reflectivity ratio of the mirrors by using glazing material or the equivalent, while increasing the number of sheets used, greatly increases the distribution of light to the increased number of surfaces, thereby generating a greater number of visible reflections. Each reflection in the resulting series of reflections is actually a composite, a superimposition of many singular reflections generated by each additional sheet in a complex way as is illustrated in the graphs of FIGS. **10** and **11**. The number of highly visible composite reflections possible under normal viewing conditions, using commercially available lighting, is equal to or greater than the number of sheets used as can be seen from FIG. **12**.

FIGS. **10** and **11** illustrate the pattern of incident light vectors of a single sheet screen and a 4 sheet screen, respectively. It can be seen from these figures that two different theoretically infinite series of reflections of the original image result, each reflection spaced at an interval equal to twice the thickness of the sheets in the screen. In the single sheet example shown in FIG. **10**, each reflection position contains one reflection while, in the multiple sheet screen illustrated in FIG. **11**, each position contains many reflections produced and distributed by each sheet in the screen and superimposed upon one another. This can be verified by tracing and counting the number of vector paths associated with each observer in FIGS. **10** and **11**.

A determination of incident light values for each vector presented in the drawings may be made by expressing them in a simplified, idealized form. By ignoring the effects of distance and absorption, each vector can be assumed to be the sum of reflected and transmitted light from vectors immediately preceding them.

For example, the fraction of incident light in the vector labeled **K4** in FIG. **11** may be assumed to equal to:

$$tK3+rJ4$$

wherein

tK**3** is the light transmitted from the vector labeled **K3**;

t=1-r wherein r is the reflectivity of the material; and

rJ**4** is the light reflected from the vector labeled **J4**.

The use of glazing material instead of mirrors provides nearly seamless illusion of depth created by closely spaced reflections. The "infinity mirror" configuration does not easily allow for close proximity between the two mirrors as the displayed object is usually placed between the mirrors. Although it is possible to create apertures or cutout portions in a full mirror to create a display, such is difficult, costly and, in terms of design creation, beyond the ability of most lay people. Therefore, in order to produce this device, multiple sheets of glazing material are required for use rather than partial mirrors.

While the described methods and devices may be suitable for the particular purpose to which they address, they would not be as suitable for the purposes of the present invention as heretofore described.

SUMMARY OF THE INVENTION

The present invention relates in general to a method and device for producing a special effect and, more specifically, to a method of producing an illusion of thickness from a flat image viewable with the unaided eye and a device for producing an animated presentation viewable with the unaided eye having an illusion of thickness from the flat image.

A primary object of the present invention is to provide a method and device for producing an animated illusion that will overcome the shortcomings of prior art devices.

A further object is to provide a method and device for producing an animated illusion that can be used by untrained persons to easily and inexpensively create depth illusions of their own designs.

An even further object is to provide a method and device for producing an animated illusion for use by both amateur and professional artists in creating works of art or commercial displays, using a colorful, 3-dimensional, animated media.

Another object of the present invention is to provide a method and device for producing an animated illusion that is simple and easy to use.

A still further object of the present invention is to provide a method and device for producing an animated illusion that is economical in cost to manufacture.

Additional objects of the present invention will appear as the description proceeds.

The foregoing objects can be accomplished by providing a method and device comprising the following elements:

In the preferred embodiment, the viewing screen is a stack of thin sheets of glazing material. In front of the viewing screen is a device for reducing glare. At a rear portion of the screen frame is an integral slotted frame receptacle for holding the display media. The display media is preferably a rigid sheet of transparent material. The transparent material is overlaid with a black coating into which a design consisting of thin curvilinear apertures have been introduced around a central portion thereof. The direction of the apertures are always directed away from the center of the media. Immediately behind the display media is a motorized color wheel having dark opaque radial boundary lines separating light-transmitting colored sectors. The motion of the color wheel is controlled to rotate by a bi-directional motor having a timing mechanism regulating its rotation. An electric light source is located immediately behind the color wheel. The system is connected and controlled by conventional wiring and switches.

When the device is activated, the dark sector boundary lines in the color wheel moving against the cutout pattern in the artwork, produce a colorful pattern of line segments moving within the configuration of the design of the cutout pattern. When viewed through the aforementioned screen this pattern of moving illuminated line segments appears as a series of gradually fading, closely spaced reflections of the original cutout pattern. The produced visual effect is a pattern of virtually smooth, colorful surfaces separated by dark gaps that appear to project back as viewed from the position of the observer and from the original image perpendicular to the screen plane fading gradually into darkness. At the same time, the individual surface segments are seen to be undulating, changing color and length, while following each other along the fixed linear path of the original cutout design which circles or spirals into or away from the dark center of the screen (depending on both the configuration of the design and the direction in which the color wheel is being turned by the motor attached thereto). The depth of this effect is equal to or greater than the product of a constant of proportionality and the number of sheets in the screen.

To the accomplishment of the above and related objects, this invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that changes may be made in the specific construction illustrated and described within the scope of the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Various other objects, features and attendant advantages of the present invention will become more fully appreciated as the same becomes better understood when considered in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughout the several views.

FIG. **1** is a top perspective view with parts cut away of the apparatus for creating an illusion of thickness from a flat image of the present invention at a preliminary stage of production;

FIG. **2** is a top perspective view with parts cut away of a portion of the apparatus for creating an illusion of thickness from a flat image of the present invention at a stage of production advanced from that of FIG. **1**;

FIG. **3** is a top perspective view with parts cut away of a portion of the apparatus for creating an illusion of thickness from a flat image of the present invention at a stage of production advanced from that of FIG. **2**;

FIG. **4** a top perspective view with parts cut away of a portion of the apparatus for creating an illusion of thickness from a flat image of the present invention at a stage of production advanced from that of FIG. **3**;

FIG. **5** is an enlarged top perspective view of the stack of sheets held within the frame and the display media of the apparatus for creating an illusion of thickness from a flat image of the present invention;

FIG. **6** is a top perspective view with parts cut away of a portion of the apparatus for creating an illusion of thickness from a flat image of the present invention at a stage of production advanced from that of FIG. **4**;

FIG. **7** is an enlarged top perspective view of a portion of the apparatus for creating an illusion of thickness from a flat image of the present invention;

FIG. **8** is a top view of the apparatus for creating an illusion of thickness from a flat image of the present invention;

FIG. **9** is a side view of the apparatus for creating an illusion of thickness from a flat image of the present invention;

FIG. **10** is a graphical illustration of the incident light distribution pattern in a one sheet screen of the apparatus for creating an illusion of thickness from a flat image of the present invention;

FIG. **11** is a graphical illustration of the incident light distribution pattern in a four sheet screen of the apparatus for creating an illusion of thickness from a flat image of the present invention; and

FIG. **12** is a graphical illustration of a comparison of visual ranges of infinity type screens vs. Window material type screens for screens including numbers of sheets ranging from 2 to 40.

DESCRIPTION OF THE REFERENCED NUMERALS

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, the Figures illustrate the method and apparatus for creating an illusion of thickness from a flat image of the present invention. With regard to the reference numerals used, the following numbering is used throughout the various drawing figures.

10 apparatus for creating an illusion of thickness from a flat image of the present invention

12 housing for containing apparatus for creating an illusion of thickness from a flat image of the present invention

14 base of housing

16 face side of housing

18 aperture cut into face side of housing

20 slot cut into base of housing

22 light source positioned within housing

24 color wheel

26 radial sector lines on color wheel

28 color sectors of color wheel separated by radial sector lines

30 rigid sheet of transparent acrylic

32 black surface laminated to rigid sheet of transparent acrylic

34 linear apertures cut into black surface

36 stack of acrylic sheets

38 one of the stack of acrylic sheets

40 dark lines appearing on stack of acrylic sheets

42 colored areas appearing on stack of acrylic sheets

44 arrow indicating direction of rotation of color wheel

46 arrow indicating apparent direction of rotation of dark lines and colored areas appearing on stack of acrylic sheets

48 viewing screen frame for holding stack of acrylic sheets

50 framed media holder for holding rigid sheet of transparent acrylic and color wheel to frame

52 gear for turning color wheel

54 motor for driving gear for turning color wheel

56 slot for holding rigid sheet of transparent acrylic

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, FIGS. **1** through **9** illustrate the apparatus for creating an illusion of thickness from a flat image indicated generally by the numeral **10**.

The apparatus for creating an illusion of thickness from a flat image **10** is shown in a partially assembled manner with parts cut away in FIG. **1** with FIGS. **2**–**4** and **6** illustrating the apparatus for creating an illusion of thickness from a flat image **10** at different stages of production. Illustrations of the apparatus for creating an illusion of thickness from a flat image **10** at different stages of production are provided to more fully illustrate the individual components of the apparatus.

As can be seen from FIG. **1** the apparatus for creating an illusion of thickness from a flat image **10** includes a housing **12** forming a hollow shell which contains the operating components of the apparatus for creating an illusion of thickness from a flat image **10** therein. The housing **12** includes an inside base **14** and a face side **16**. Cut into the face side **16** is an aperture **18** for viewing into the housing **12**. The aperture **18** is preferably square in shape although any shape aperture may be cut into the face side **16** as long as a viewer can see therethrough and into the housing **12**. A slot **20** is cut into the base side **14** opening into the shell formed by the housing **12**. Positioned within the shell formed by the housing **12** and connected to and extending from the base side **14** is at least one light source **22**. In the preferred embodiment and illustrated in the figures a plurality of light sources are positioned within the shell formed by the housing **12**. The light source **22** is preferably an array of commercially available light bulbs is positioned on a side of the slot **20** opposite the face side **16** and secured to the base **14** such that it provides sufficient light to produce the desired effects as will be described hereinafter. The slot **20** is positioned between the light source **22** and the aperture **18** and the light source **22** is located within the rear end of the shell formed by the housing **12** wherein it is the element closest to the back wall of the housing **12**.

As shown in FIG. **2**, a color wheel **24** is positioned within the shell formed by the housing so as to partially extend into the slot **20**. The color wheel **24** includes a plurality of radially extending sector lines **26** dividing the color wheel **24** into a plurality of color sectors **28**. The sector lines **26** are preferably dark, opaque lines extending from the center of the color wheel **24**. The sector lines **26** define the shape of the color sectors **28**. The color sectors **28** are formed of light-transmitting material. The size of both the sector lines **26** and color sectors **28** may vary depending only on the effect desired by the viewer.

The display media **30** is preferably a rigid square sheet of transparent acrylic laminated with black construction paper **32** into which a design of thin linear apertures **34** have been cutout around a central portion thereof, and which, in part, determines the configuration of display. A design cut into the display media **30** is illustrated in FIG. **3**. Preferably, the design of said artwork is comprised of a configuration of thin lines, i.e. relative to the media area which are illuminated against a generally dark, opaque background and occupy a relatively small portion of the media. The orientation of the lines should be offset from the center of the media while progressing towards it to some degree but never meeting the center.

The plurality of glazing quality acrylic sheets **36** are illustrated in FIGS. **4** and **5** with a display media **30** positioned therebehind. The plurality of glazing quality acrylic sheets **36** are formed as a group of individual glazing quality acrylic sheets **38** As can be seen from this figure, the plurality of glazing quality acrylic sheets **36** are positioned in front of the color wheel **24** with the display media **30** positioned therebetween. When viewing the display media **30** through the plurality of glazing quality acrylic sheets **36** with the color wheel **24** positioned on the opposing side of the display media **30** a plurality of alternating dark lines **40** and colored areas **42** in the form of the design of thin linear apertures **34** cut into the display media **30** is viewed. When the color wheel **24** is turned in the direction indicated by the arrow labeled **44**, the plurality of alternating dark lines **40** and colored areas **42** in the form of the design of thin linear apertures **34** cut into the display media **30** appears to rotate in the direction indicated by the arrow labeled **46**.

FIG. **6** illustrates a viewing screen frame **48** secured to the base **14** and positioned between the color wheel **24** and the face side **16** within the shell formed by the housing **12**. The viewing screen frame **48** is positioned so as to be framed by the aperture **18** cut into the front side **16** of the housing **12**, thus the viewing screen frame **48** can be clearly seen when looking through the aperture **18**. The viewing screen frame **48** houses the plurality of glazing quality acrylic sheets **36**. Each of the glazing quality acrylic sheets **38** are preferably 1/16 inch thick and any number of individual glazing quality acrylic sheets **38** may be positioned within the viewing screen frame **48**. Although any number of glazing quality acrylic sheets **38** may be used, in the preferred embodiment thirty-two of the glazing quality acrylic sheets **38** are positioned within the viewing screen frame **48**. The use of an anti-glare substance or device (not shown) with the viewing screen is necessary to reduce outside reflections.

Located directly behind, parallel to and centered within the viewing screen frame **48**, is a slotted, framed media holder **50**. FIG. **7** illustrates an exploded view of the framed media holder **50**. The framed media holder **50** is integrally connected to the viewing screen frame **48** whereby the display media **30** and the color wheel **24** are held in place with respect to the plurality of glazing quality acrylic sheets **36** by the framed media holder **50**. There are preferably four (4) of the framed media holders **50**, one at each corner of the viewing screen frame **48**. In the preferred embodiment of the invention, the framed media holder **50** forms a template holding slot **56** between the viewing screen frame **48** and the color wheel **24** which is open at the top to allow for changing display media **30** by sliding in and out as is indicated by the arrows illustrated in FIG. **7**. The color wheel **24** is held in position by rotational gears **52** the framed media holders **50** and allowed to rotate therewith.

Secured to the base **14** of the housing **12** and connected to one of the rotational gears **52** of the framed media holder **50** is a frictional drive motor **54**. The frictional drive motor **54** imparts rotation to the rotational gear **52** to which it is connected. The rotation imparted to the rotational gear **52** is then transferred to rotate the color wheel **24** in the opposing direction. This causes the plurality of alternating dark lines **40** and colored areas **42** in the form of the design of thin linear apertures **34** cut into the display media **30** to appear to rotate in the direction indicated by the arrow labeled **46**.

The relationship of each element in their position within the housing to one another can be clearly seen from both the top view illustrated in FIG. **8** and the side view illustrated in FIG. **9**. As can be seen from these figures, the viewing screen frame **48** houses the plurality of glazing quality acrylic sheets **36** and is located between the aperture **18** in the face side **16** and the display media **30** which is held in position by the framed media holder **50**. Directly behind the display media **30** is the color wheel 24 which is connected to and controlled to rotate by the motor **54**. The color wheel is positioned to extend from the slot **20** within the base side **14** of the housing **12**. The light source **22** is located behind the color wheel **24**.

Rotation is transmitted to the color wheel **24** directly at its circumference by friction drive motor **54** via the rotational gear **52** connected therebetween. Due to the size and relationship of the color wheel **24** to the screen and base in the preferred embodiment, the lower portion of the color wheel **24** projects through slot **20** in the base **14**.

The interposition of the sector lines **26** rotating against the linear cutout pattern cut into the display media **30** separates the lines into an ever changing pattern of undulating linear segments separated by dark gaps. When the plurality of glazing quality acrylic sheets **36** are placed within the viewing screen frame **48** and in front of this rotating, back lit assemblage, the original pattern is multiplied into a series of closely spaced, superimposed reflections by the matrix of reflective surfaces. These reflections are spaced so closely as to create the appearance of a pattern of virtually solid surfaces, separated by dark gaps. These gaps gives the final display its surface definition. The apparent surfaces are oriented at right angles to the screen while fading back into darkness. At the same time the pattern is seen to be circling or spiraling into or away from the dark center of the screen depending on both the configuration of the design and the direction in which the color wheel is turning.

Due to the design of the template and the counterclockwise direction of rotation indicated by the arrow labeled **44** of the color wheel **24**, the segmented surfaces appear to move in the same direction indicated by the arrow labeled **46**, congruently along their planes, spiral inward and then revolve at some distance around the center of the screen. Reversing the rotation of the color wheel **24** creates the opposite illusion, i.e., of the surfaces moving congruently along their planes in the opposite direction and spiraling outward from the center.

Practicing the method of the present invention using varying numbers of sheets illustrates the multiplying effect of using multiple sheets by comparing the resulting pattern of singular term equations in a single sheet screen to multiple term pattern of the equations in the multiple sheet screen. It can be seen that the sum of the coefficients in each vector equation are the actual number of superimposed reflections present in each R_i vector in FIG. **11**.

The depth of the illusion, i.e. the visible range of these reflection series, is dependent upon several variables including: the number of reflective surfaces (assuming fixed high transparency/reflectivity ratio material), the color of the source light, the intensity of the light source and the ambient lighting and/or viewing conditions (including the amount of glare). Concatenating multiple sheets of glazing material has an augmenting effect due mostly to its high transparency/reflectivity ratio(as compared to that of partial mirrors) which allows for a more uniform distribution of light to be transmitted and reflected within the matrix at nearly 100% efficiency. Ignoring other factors, as the number of sheets increases, the visible range increases roughly in direct proportion while average brightness decreases. There comes a point at which the addition of sheets degrades the quality of the display due to effects of multiplying refraction and imperfections of individual sheets.

Repeated observations suggests that the number of the most prominently visible composite reflections generated by s number of sheets is, in fact, equal to s. FIG. **12** also reinforces this by showing pronounced decreases in the slopes of the fractional light function curves are found to appear at their respective sheet-number data points, e.g., at reflection #10 on the 10 sheet curve and at reflection #20 on the 20 sheet curve. Further confirmation of this relationship can be found by examining the vectors in FIG. **11** that start from reflection position R_0 and include every vector combination that ends at observer positions R_1, R_2, R_3 and R_4. The vectors within these composite reflection paths contain vectors with at least two reflections, i.e., a path containing at least two changes of direction to get from row “A” vectors to row “I” vectors ending at R_4 (4=number of sheets in screen in FIG. **11**).

All vectors illustrated in FIG. **11** that end at observer position greater than R_4 require four or more changes in direction from display position R_0. The additional reflections reduce the light from those positions significantly enough to cause the perception of a boundary condition, i.e., the end of the series. Therefore, it is reasonable to conclude that the last brightest composite reflection in the series will appear at position R_s (s=number of sheets in the screen).

As is illustrated in FIGS. **10** and **11**, each receding reflection appears at equal intervals equal to twice the distance between the reflecting surfaces or 2T. If the maximum number of the most prominently visible reflections is s and thickness of each sheet is T (which is also the distance between reflecting surfaces), the thickness or depth of the reflection series is equal to or greater than $2\times T\times s$.

If the intensity of the source light increases the perceived brightness and range will increase roughly in proportion to the log of the intensity (Weber-Fechner Law). Color also effects light intensity: towards the infrared end of the spectrum they are least intense and result in less than maximum number of visible reflections. Ambient lighting and viewing conditions also effect the resulting display inversely. The relatively small gaps between reflections creates the illusion of a nearly seamless projection of the original image, as if a solid extrusion of a cross section.

From the above description it can be seen that the method and device for producing an animated illusion of the present invention is able to overcome the shortcomings of prior art devices by providing a method and device for producing an animated illusion that can be used by untrained persons to easily and inexpensively create depth illusions of their own designs. The method and device for producing an animated illusion is made for use by both amateur and professional artists in creating works of art or commercial displays, using a colorful, 3-dimensional, animated media. Furthermore, the method and device for producing an animated illusion of the present invention is simple and easy to use and economical in cost to manufacture.

It will be understood that each of the elements described above, or two or more together may also find a useful application in other types of methods differing from the type described above.

While certain novel features of this invention have been shown and described and are pointed out in the annexed claims, it is not intended to be limited to the details above, since it will be understood that various omissions, modifications, substitutions and changes in the forms and details of the device illustrated and in its operation can be made by those skilled in the art without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention.

The foregoing description of the preferred embodiment of the invention has been presented for the purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching. It is intended that the scope of the invention be limited not by this detailed description but rather by the claims appended hereto.

What is claimed is new and desired to be protected by Letters Patent is set forth in the appended claims:

1. A method of producing an illusion of depth comprising the steps of:

a) forming a plurality of sheets into a stack for serving as a viewing screen, each sheet having a thickness based on a desired degree of smoothness of the illusion and an amount of said plurality of sheets equal to the desired depth of the illusion divided by twice the thickness of a typical one of the plurality of sheet;

b) selecting an amount of said plurality of sheets based upon said desired degree of smoothness of the illusion:

c) forming a gap between each of said plurality of sheets, a size of said gap being equal to the thickness of one of said plurality of sheets;

d) creating a design having at least one of relatively thin linear and curvilinear design elements on a design media capable of being illuminated by at least one of reflected and transmitted light, said design occupying a minority portion of the media, the remaining portion of the media providing a background; and

e) illuminating said design with a light source having an empirically chosen intensity.

2. The method of producing an illusion of depth as defined in claim **1**, further comprising the step of determining an amount of said plurality of sheets by dividing said desired depth of the illusion by 4 times the thickness of one of said plurality of sheets.

3. The method of producing an illusion of depth as defined in claim **2**, further comprising the steps of forming a design of substantially opaque lines angularity offset with respect to the linear design on the design media on a display media; imparting bi-directional motion to one of the design and display media, wherein the substantially opaque lines of the design of the display media are separated by light transmitting portions; and arranging the display media substantially in line with the design media, wherein the arrangement produces a changing interference pattern creates an illusion of surfaces having depth with motion determined by the change in the interference pattern when viewed through the plurality of sheets.

4. The method of producing an illusion of depth as defined in claim **3**, wherein the display media is in the form of a color wheel having opaque radial lines comprising a smaller portion of a total area of the color wheel and light transmitting colored sectors comprising a remaining portion thereof.

5. A device for producing an illusion of depth from a flat image, comprising:

a) a plurality of sheets, each of said sheets being at least partially transparent and reflective;

b) a light source;

c) a design media having at least one of relatively thin linear and curvilinear design elements cut therein positioned between the plurality of sheets and said light source;

d) a frame for holding said plurality of sheets therein and forming a slot therebehind for holding said design media, wherein illumination of said light source produces an illusion of depth for said at least one of relatively thin linear and curvilinear design elements cut into said design media; and

e) a display media having a design of a plurality of substantially opaque lines angularity offset with respect to the linear design on the design media and positioned between said design media and said light source.

6. The device for producing an illusion of depth from a flat image as claimed in claim **5**, further comprising means for imparting rotation to said display media.

7. The device for producing an illusion of depth from a flat image as claimed in claim **6**, further comprising a housing including a face side having an aperture cut therein and a base side, said plurality of sheets, frame, design media, display media and light source being positioned atop said base side within said housing and being viewable through said aperture in said face side, said base side including a slot therein through which said display media extends.

8. The device for producing an illusion of depth from a flat image as claimed in claim **6**, wherein said means for imparting rotation to said display media imparts bi-directional motion to said display media.

9. The device for producing an illusion of depth from a flat image as claimed in claim **8**, wherein a gap exists between each of said plurality of sheets.

10. The device for producing an illusion of depth from a flat image as claimed in claim **9**, wherein each of said plurality of sheets has a thickness and said gap between each of said plurality of sheets has a size equal to the illusory depth produce by the device multiplied by four times said thickness of each of said plurality of sheets.

11. The device for producing an illusion of depth from a flat image as claimed in claim **5**, wherein each of said plurality of sheets are formed of glazing quality acrylic sheets.

12. The device for producing an illusion of depth from a flat image as claimed in claim **11**, wherein each of said plurality of sheets has a thickness of 1/16 inch and said frame holds thirty two of said sheets.

13. The device for producing an illusion of depth from a flat image as claimed in claim **7**, wherein said display media includes a plurality of light-transmitting color sectors defined by said plurality of substantially opaque lines.

14. The device for producing an illusion of depth from a flat image as claimed in claim **7**, wherein the display media is in the form of a color wheel having opaque radial lines comprising a smaller portion of a total area of the color wheel and light transmitting colored sectors comprising a remaining portion thereof.

15. The device for producing an illusion of depth from a flat image as claimed in claim **7**, wherein said design media is a rigid sheet of transparent material overlaid with a black coating.

16. The device for producing an illusion of depth from a flat image as claimed in claim **15**, wherein said at least one of relatively thin linear and curvilinear design elements cut into said design media extend in a direction away from a center of said design media.

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