

Jan. 20, 1925.

1,523,992

W. C. HADLEY

DESIGN DEVELOPMENT

Filed April 30, 1923

2 Sheets-Sheet 1

Fig. 1

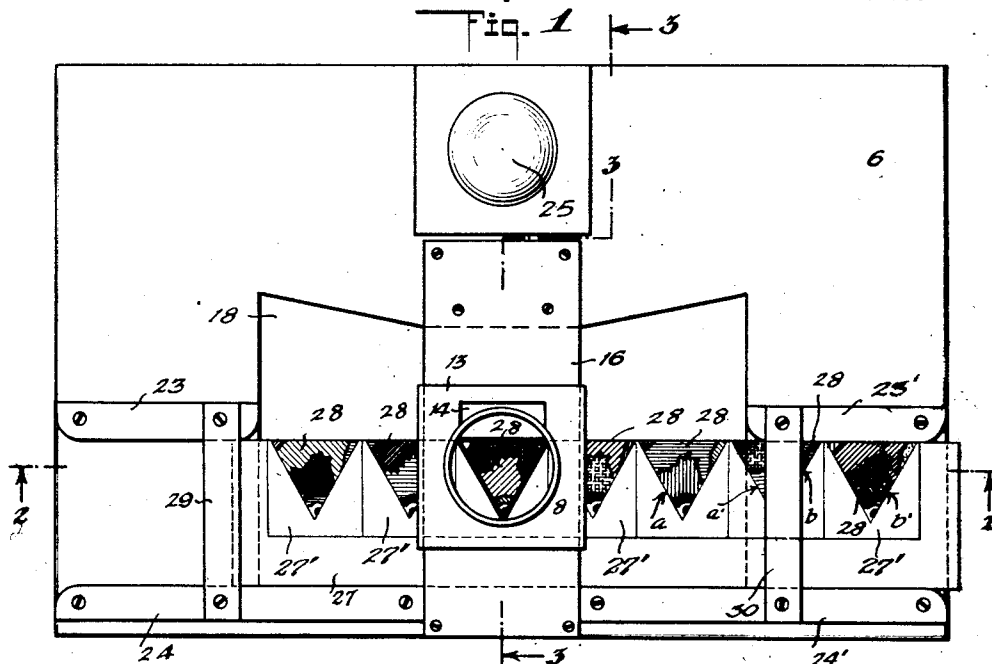
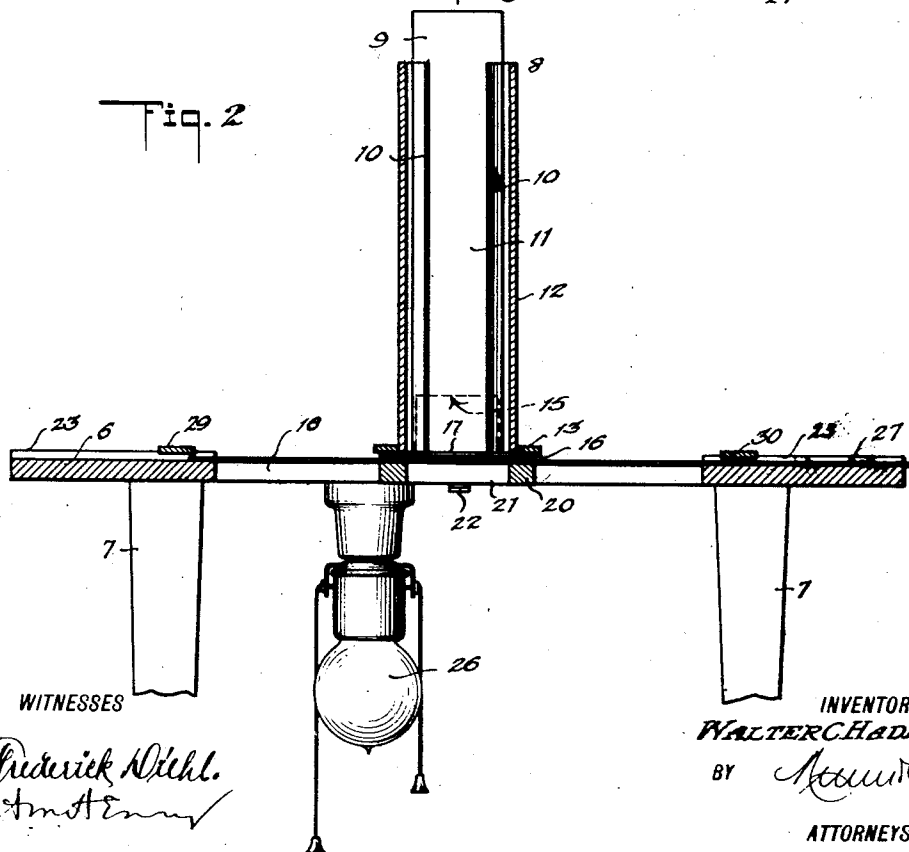


Fig. 2



WITNESSES

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Jan. 20, 1925.

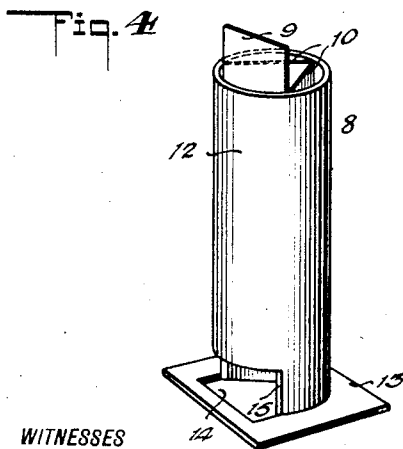
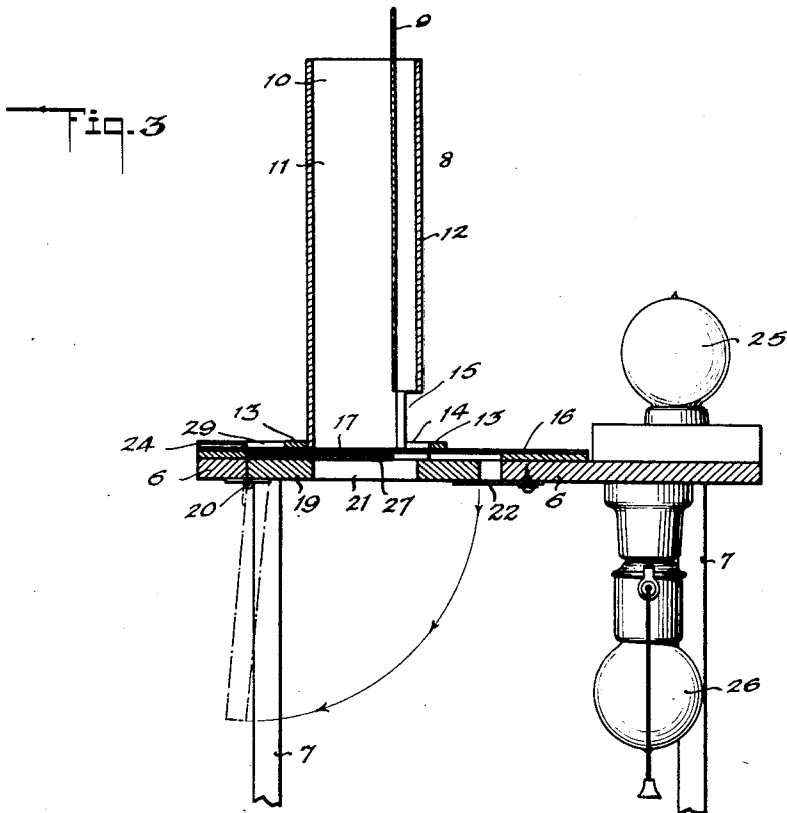
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DESIGN DEVELOPMENT

Filed April 30, 1923

2 Sheets-Sheet 2



WITNESSES

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UNITED STATES PATENT OFFICE.

WALTER C. HADLEY, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN PRINTING COMPANY, OF FALL RIVER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

DESIGN DEVELOPMENT.

Application filed April 30, 1923. Serial No. 635,680.

To all whom it may concern:

Be it known that I, WALTER C. HADLEY, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county of New York and State of New York, have invented new and useful Improvements in Design Development, of which the following is a full, clear, and exact description.

The present invention relates broadly to that class of optical instruments known as kaleidoscopes, and more particularly aims to provide an improved method and apparatus useful in design-generation as well as in design-development and of particular value in textile designing.

In my co-pending application Sr. No. 635,689, filed April 30, 1923, I disclose and claim a method of and apparatus for the kaleidoscopic generation of designs by the use of a projection beam, and further disclose in connection therewith a method and apparatus whereby a translucent sheet-like design-generating instrumentality or mother sheet, even of limp and inelastic flexible material, as thin cloth, may be employed to generate a satisfactory design, may be treated so as to indicate subsequently the area of the sheet which created such design, and so may be later turned over to a copying artist for reproduction into the finished design by the brush of such artist.

Once a design is generated from a mother sheet as aforesaid, and such design is reproduced by the copying artist so far as configurations are concerned, it usually next becomes important to determine various color schemes to be adopted in applying the design to a textile fabric.

It is the prime object of the present invention to provide a novel and valuable method of developing a given design configuration, say one generated by the projection method and apparatus of my said co-pending application. Otherwise stated, is an important object of the invention, is to provide a method of visually developing a previously created design, particularly in regard to various color schemes, so that various replicas of the design, but each of a different color scheme, may be readily observed and com-

pared, and repeatedly so observed and compared.

A further object is to provide such a method, and one which, while fully adequate to satisfy the important object above mentioned, involves the preparation, at a minimum of trouble and expense, of a design-developer means for a particular color scheme for an accepted design or for all the different color schemes tentatively selected for the accepted design.

Still another object of the invention is to provide a small, compact, light and hence easily portable apparatus designed for co-action with a design-developer means as above indicated; as for use by a salesman for the textile mill when interviewing customers. In this connection it may be explained that many mills do not manufacture figured textiles until after the customer has given his order based on artists' sketches of different suggested designs and of the same designs according to various color schemes.

An incidental object of the invention is to provide an apparatus of the above type, and one wherein simple and convenient means are incorporated for permitting the apparatus to be also used for design generation, in substitution for the method and apparatus of my said co-pending application Sr. No. 635,689.

Thus it will be seen that the present invention, in aiming to satisfy the object last mentioned, has the further object of providing a kaleidoscopic apparatus in which there may be used interchangeably, optical interponents of quite dissimilar types, that is, an optical interponent which is a design-generating instrumentality or mother sheet of the kind described in my said co-pending application, and hereinafter called the mother sheet interponent, and a design-developing instrumentality or color-variation sheet, hereinafter called the color sheet interponent.

Various other objects will be in part obvious and in part specifically referred to hereinafter.

The invention will be more clearly understood from the following description, when taken in connection with the accom-

panying drawings, showing a preferred apparatus.

In said drawing,

Fig. 1 is a top plan view of the embodiment;

Fig. 2 is a vertical section, taken on line 2—2 of Fig. 1;

Fig. 3 is also a vertical section but taken on line 3—3 of Fig. 1;

Fig. 4 is a perspective view of a form of kaleidoscope unit or tube preferred to be used; and

Fig. 5 shows a kaleidoscopically created design such as would be seen were the eye applied to the upper end of the tube of Fig. 4 with the corresponding design-repeat element of Fig. 1 arranged relative to the lower end of said tube and then subjected to enough illumination to constitute said element an optical interponent as aforesaid.

The method of design-development, and, at will, design-generation, according to the present invention, will be best understood if first the apparatus shown in the drawings is described in detail.

On a main supporting structure 6, which is desirably a horizontal or shelf structure on legs 7, is positioned a tube 8. Such tube may of course be designed to have any number of mirror or prism walls, to provide, as is well understood in the art, a reflecting chamber having a cross-sectional shape according to any regular or irregular polygon. In the present case, the tube 8 has three mirrors 9, 10 and 10, and these mirrors are so relatively inclined as to present a reflecting chamber 11 having the cross-section of an equilateral triangle. Tube 8 is a bodily removable one to be supported merely by gravity when placed in the apparatus as shown. The outer sleeve 12 of the tube has a flat square bottom-plate 13, provided with a triangular opening aligning with the bottom of the reflecting chamber. This opening is enlarged as indicated at 14 in Figs. 1, 3 and 4. The mirror 9 is of the same length as the mirrors 10 but is set higher in the tube to provide at its top a projecting wall to constitute a light shield or hood and to provide an opening for the bottom of the tube opposite a window 15 in the lower end of sleeve 12.

When tube 8 is in position in the apparatus as illustrated, the bottom plate 13 rests on a bridge or platform 16, having an opening 17 surrounding the bottom of the reflecting chamber in the tube.

In the present case, the shelf structure 16 includes a frame-like shelf proper of wood having an opening 18; and platform 16 is conveniently a thin metal strip spanning the middle of this opening transversely of the apparatus.

Below said platform 16 is a second plat-

form 19, conveniently of wood, and hinged to the shelf structure as indicated at 20. Platform 19 is provided with an opening 21 shaped to align with the opening 17 through platform 16 when the platform 19 is swung up from the dot-and-dash location of Fig. 3 to the full-line one shown. When platform 19 is thus swung up, and a pivoted catch 22 is adjusted as shown in Fig. 3, the platform is held parallel with platform 16 but spaced below the same sufficiently to constitute a supporting means for any desired type of optical interponent to permit the latter to be shifted in a single plane relative to the reflecting chamber of the tube.

In combination with the supporting and guiding means thus provided by platform 19 for an optical interponent, there is provided a further guiding means for a certain type of interponent. This latter guiding means constitutes a means for limiting such interponent to movement in a predetermined path in said plane; and here includes a pair of continuous guiding devices or rails 23 and 24. These rails may be continued, beyond opening 18, as best indicated at 23' and 24' in Fig. 1.

On opposite sides of the main supporting or shelf structure 6, and in each case to one side of the openings in platforms 16 and 19, are provided sources of illumination, as incandescent electric bulbs, 25 and 26.

The optical interponent illustrated, at 27, is a rather stiff paper or cardboard sheet having drawn on areas 27' on the upper face of the sheet (or on separate sheets pasted or otherwise mounted on sheet 27), a plurality of design-repeat elements 28, identical as to configuration, but differing as to color scheme as indicated. Properly to co-act with the rail structure here incorporated as the limiting means aforesaid, this sheet 27 is a strip-like member with the elements 28 arranged in column; and so that when the tube is properly set on platform 16, a straight-line shifting of sheet 27 a predetermined distance will accurately substitute one element 28 for another relative to the reflecting chamber of the tube, these elements are disposed on the sheet so that a particular characteristic bounding line of one element is parallel to the corresponding bounding line of the adjoining element.

Cross straps 29 and 30, overlying rail portions 23 and 24 and 24', may be added to assist platforms 16 and 19 in holding interponent 27 to uniplanar extension at all times.

The method of the present invention, preferably such a method that the real and only object thereof is a color comparison relative to a plurality of designs of the same configuration, is, when carried out

with the aid of the apparatus just described, substantially as follows:

A suitable configuration for a design-repeat element is assumed to have been already evolved, as by use of the apparatus of my said co-pending application Sr. No. 635,689, or otherwise. An optical interponent 27 is then prepared by an artist, so that a plurality of hand-drawn colored design-repeat elements 28 are carried by the interponent as above described. Next a kaleidoscope tube is provided and arranged so as to permit application of the eye to an end of the tube to observe the interior of the reflecting chamber and to admit light rays to the interior of the chamber. Finally, the tube and the interponent are relatively disposed so that the light rays aforesaid strike a selected one of the repeat elements 28 and reflect an image of the colored design of such element onto each of the walls of the reflecting chamber of the tube, thereby to kaleidoscopically reproduce a complete design, such as that indicated in Fig. 5, and according to the color scheme of the particular element 28 set to co-act with the tube. Interponent 27 may be shifted as required to substitute one repeat element 28 for another practically instantaneously, for comparing a large number of different color schemes for a design previously approved as to configuration.

As hereinabove indicated, however, the invention provides a method of complete design-creation, that is, a method involving not only design-development as to color scheme but a preliminary or initial design-generation as to configuration, and such a complete method of design-creation which may be very conveniently and economically carried out with the assistance of the apparatus shown in the drawing. Such method of design-creation is substantially as follows: A mother sheet optical interponent (not shown, but having markings as and for the purpose defined in my said co-pending application) is placed loosely between platforms 16 and 19; this interponent always being of the proper size to permit the same to be shifted in its own plane by finger manipulation within opening 18. If the mother sheet is of cloth or similar flimsy material, the platform 19 may be unlatched and lowered toward the dot-and-dash location indicated in Fig. 3, the mother sheet may be placed under platform 16, and platform 19 may be elevated and again latched in place by catch 22. If the mother sheet is of translucent material, and there is not enough natural light, bulb 26 is lighted; and also bulb 25, if desired, the latter to send its rays through window 15 of tube 8. If the mother sheet is of opaque material bulb 25 is lighted. When, during shifting of the mother sheet as

aforesaid relative to platform 19, an acceptable design is seen through the eye or upper end of tube 8, a permanent indicium is made on the other sheet, as by the device and method of my said co-pending application, to mark off the particular area of the mother sheet which, constituting the repeat element of the accepted design, generated the latter by way of the well-known action of the kaleidoscope tube. This mother sheet is then removed from the apparatus, turned over to the artist, and from such mother sheet the artist prepares the optical interponent 27 as above described. Thereupon this interponent 27 is placed under the guiding control of platform 19 and also of rails 23 and 24 and 23' and 24', and the same apparatus is used to carry out the above-described method of design-development as to color scheme.

It will thus be seen that the present invention also provides a method of design-creation which may be said to involve shifting a mother sheet interponent relative to a kaleidoscope tube to create a design including a plurality of identical repeat elements, making a plurality of copies of such an element, applying dissimilar colorings to the identical configurations of each such copy, and successively disposing the various copies relative to the same tube to reproduce a succession of said designs, each complete but each according to a different color scheme.

It will further be seen that the present invention provides, as a new article of manufacture, a color sheet interponent for a kaleidoscope design-developer, said sheet being provided, preferably on the same face thereof, with a plurality of similar, and preferably identical, polygonal areas, each area carrying the same design as to configuration but a different design as to color scheme. In the present case said areas are arranged in column lengthwise of an elongate sheet, or strip, and with the areas arranged so that each characteristic bounding line thereof is parallel to the same bounding line of an adjacent area. The purpose of the feature last mentioned is of course to facilitate the instantaneous substitution of one area for another relative to a fixed tube, merely as the result of shifting the strip interponent in a straight-line path parallel to the length of the interponent. As to the feature of the invention now being discussed, such feature may be more broadly described as involving an arrangement of the areas on a color-scheme interponent such that one bounding line of one area (see line *a*, Fig. 1), is extended at the same angle to a bounding line of another area (see line *b*), as the bounding line of the last-mentioned area (line *a'*), corresponding to the first-mentioned bounding line of the first-mentioned area (line *a*),

is extended relative to a bounding line of a third area (line b'), corresponding to the first-mentioned bounding line of the second-mentioned area (line b); as would describe
 5 a color scheme interponent of disk type pivoted at its center and having the areas arranged symmetrically relative to such center, and where of course a fractional rotation of the disk moves the areas in the
 10 path predetermined to substitute one area for another relative to the tube.

Variations may of course be resorted to within the scope of the following claims:

I claim:

15 1. The method of kaleidoscopic design-development, which involves providing a kaleidoscope tube having a reflecting chamber of polygonal cross-section, providing a
 20 single color-sheet interponent carrying a plurality of polygonal designs each disposed within an area similar in shape to the cross-section of the reflecting chamber of the tube, each such design having similar design configurations but with certain of such configurations in each area differently colored, and
 25 shifting the interponent relative to the tube to substitute one of said designs for another for kaleidoscopic reflection within the tube.

2. The method of design-creation, which
 30 involves providing a kaleidoscope tube, providing and shifting a mother sheet interponent relative to the tube to generate a design including a plurality of identical repeat elements, making a plurality of copies
 35 of such repeat elements, applying dissimilar colorings to the same configurations of each such copy, and successively disposing the various copies relative to a kaleidoscope tube to reproduce a succession of said designs, each complete but each according to
 40 a different color scheme.

3. As a new article of manufacture, a color sheet interponent for a kaleidoscopic design-developer, said sheet having a plurality
 45 of similar polygonal areas each having the same design as to configuration but a different design as to color scheme.

4. As a new article of manufacture, a color sheet interponent for a kaleidoscopic design-developer, said sheet having a plurality
 50 of identical polygonal areas each having the same design as to configuration but a different design as to color scheme, all said areas being on the same face of the
 55 sheet.

5. As a new article of manufacture, a color sheet interponent for a kaleidoscopic design-developer, said sheet having a plurality
 60 of identical polygonal areas each having the same design as to configuration but a different design as to color scheme, said areas being arranged in column.

6. As a new article of manufacture, a color sheet interponent for a kaleidoscopic

design-developer, said sheet having a plurality
 65 of identical polygonal areas each having the same design as to configuration but a different design as to color scheme, said areas being arranged so that each characteristic bounding line of an area is parallel to
 70 the same bounding line of an adjacent area.

7. As a new article of manufacture, a color sheet interponent for a kaleidoscopic design-developer, said sheet having a plurality
 75 of identical polygonal areas each having the same design as to configuration but a different design as to color scheme, said areas being arranged so that one bounding line of one area is extended at the same
 80 angle to a different bounding line of another area, as the bounding line of the last-mentioned area, corresponding to the first-mentioned bounding line of the first-mentioned area, is extended relative to a bounding
 85 line of a third area corresponding to the first-mentioned bounding line of the second-mentioned area.

8. In kaleidoscopic apparatus, the combination of means for supporting a kaleidoscope tube in a selected position, means for
 90 holding an optical interponent for the tube to a plane substantially perpendicular to the line of extension of the tube while permitting movement of the interponent in such plane, and means for limiting the last-
 95 mentioned movement of the interponent to a predetermined path in such plane, said holding means being spaced from said limiting means and from the tube-supporting
 100 means to permit a second optical interponent to be employed of such smaller size as to be independent of the control of the limiting means.

9. In kaleidoscopic apparatus, supporting and guiding means for a shiftable optical
 105 interponent comprising a platform having an opening therein and adapted to support a kaleidoscope tube above such opening, a second platform below the first platform and having an opening therethrough under
 110 the opening in the first platform, said platforms being substantially parallel but spaced to permit an optical interponent to be shiftablely carried between the platforms, a source of illumination above the upper
 115 platform and to one side of its opening, and a source of illumination below the lower platform and to one side of its opening.

10. In kaleidoscopic apparatus, supporting and guiding means for a shiftable optical
 120 interponent comprising a platform having an opening therein and adapted to support a kaleidoscope tube above such opening, and a second platform below the first platform and having an opening therethrough,
 125 and hinge and catch means for the lower platform whereby the latter may be held slightly spaced from and substantially parallel

allel with the first platform and may be swung downwardly away from the first platform.

11. In kaleidoscopic apparatus, supporting and guiding means for a shiftable optical interponent including a plurality of guides several of which are fixed and one of which is movable.

12. In kaleidoscopic apparatus, supporting and guiding means for a shiftable optical interponent including a plurality of guides one of which is a pivotally mounted guide plate and another of which is a fixed guide rail. 10

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