

Design and Presentation of Wine Packaging Based on Interactive Digital Technologies

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Abstract. The advancement of digital technology is offering more and more possibility for the presenting of packaging designs. The maturing internet technology has managed to provide technical support for remote interactive experiences. Digital modeling and interactive virtual presentation of packaging products have become the focal point of industrial researches. The author in this paper successfully demonstrates the designs and network virtual presentations of liquor container packages, using software like 3DSMAX, Cult3d Designer and DreamweaverMX, having the customers satisfied and the competitiveness of the product improved in result.

Introduction

The development of digital technology has lead the modern society into the age of Digital Subsistence in the manner the “Four Great Inventions” have made to the human civilization. The application of computer technology has strengthened and expended the cognitive and manipulating abilities of the human race, particularly in packaging design industry, where the introduction of digital technology has made it possible for the designers to push the limit of their imagination to the utmost, providing more works diversified in style. The 3D modeling software-based artistic presentation of liquor containers is more visualized and emotionally closer to the product it is trying to present, way superior to the traditional means of statistic presentation. The internet-based remote interaction makes it easy for consumers to acquire the information of the visual features and internal structure of a packaging work, which makes the products more competitive and credible to the consumers.

Modeling & Design Output with 3DSMAX

3DSMAX Modeling

3DSMAX is a PC-based 3D modeling and animation-making software with powerful 3D model capabilities, developed by Autodesk, which can be used to create the surrealistic works. It has been extensively used in packaging design, interior finishing, game development, character design and virtual reality, etc. It is also the most popular 3D animation-making software of the world, with its rendering speed and performance way superior to its similar.[1] There are many ways of modeling available on 3DSMAX, including basic modeling, composite object modeling, modeling by polygon transect line and NURBS, etc.[2] The first thing in the modeling of liquor container packaging on 3DSMAX is to confine its dimensions. Take the typical cylindrical or cone-shaped containers for example, for which polygon transect line is the most frequently used means of modeling, using Bezier curves to shape the (hemihedral) boundary contour of the container in frontal view in the drafting zone with polygon curves, and then use the "lathe" tool in the Modify panel to have the contour machined, with its core welded to have the bottle model. Afterwards use "lathe" to generate components like the lid and labels, following by regulation of positioning, volume and proportion, until a bottle-shaped original model is generated. The following issues should be noted in 3D modeling:

- 1) The mm-based unit system should be set before modeling;
- 2) The contour should be precisely modeled with the dimensions and proportion properly tuned to avoid the intensive modification.
- 3) The model should be contoured by double-lines to highlight the wall thickness of the container;
- 4)The "face number" should be properly determined in machining, never too fine that drags the computing speed down, nor too rough to compromise the smoothness of the model surface.

The model is generated hereunder(Fig.1):

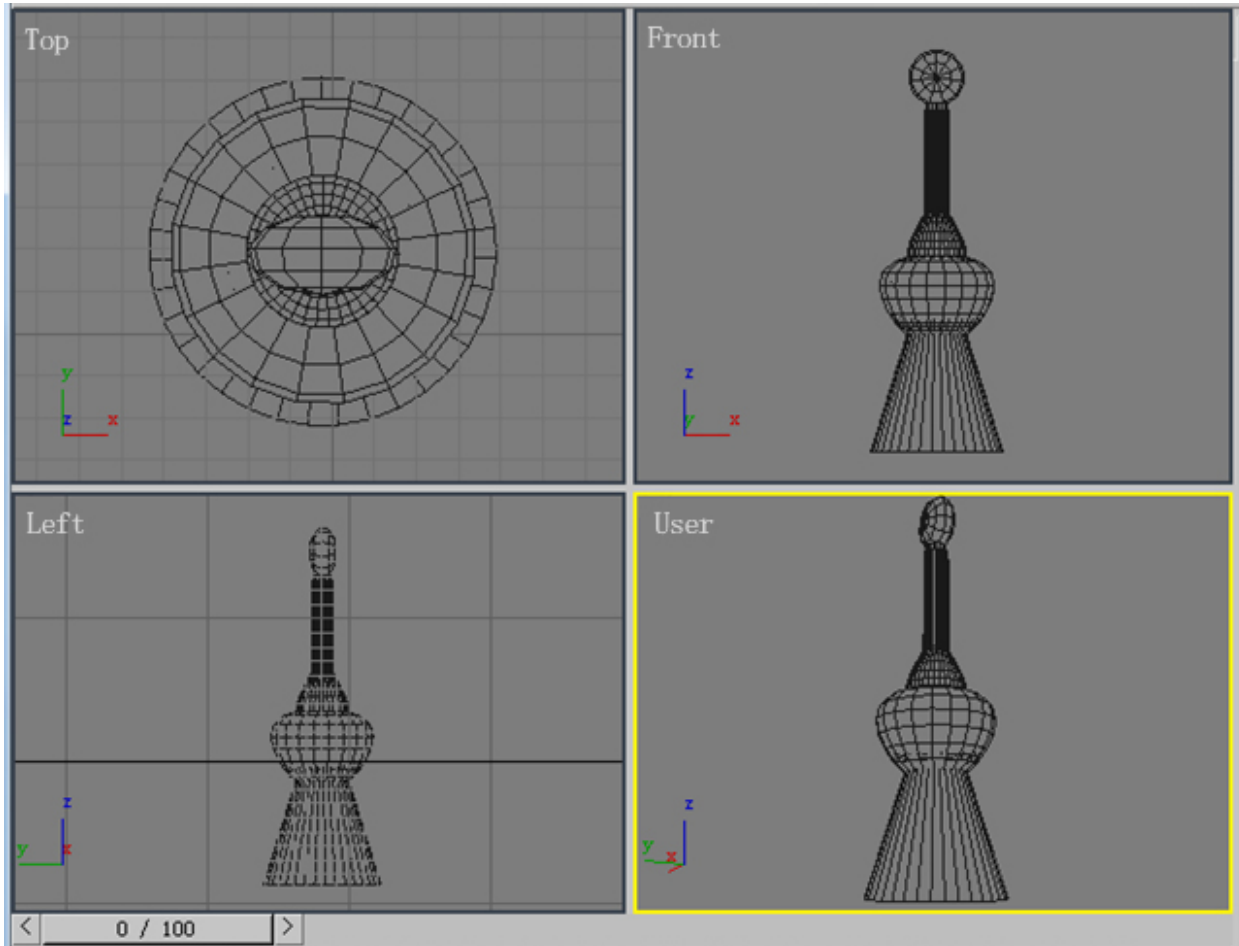


Fig.1 3DSMAX Modeling of Liquor Container

Texturing

The texturing of the basic model of a liquor container is rendered by setting up the parameters in the texture editor. Press M to trigger the texture editor, and rename a new texture ball as GLASS. Single-click the texture allocating button to designate the standard texture to the "bottle" object. Set the transparency of the texture as 15, and define the chartlet to simulate the texture of glass. The lid is rendered in metallic texture.

The rendering capability of Cult3D is far from completed, thus it is unnecessary to set the lights in 3DSMAX, for shadow-tracing is very consumptive for the hardware resource, and having the lights on will increase the coloring time.

Output in C3D Files

The completed model should be output in C3D files. Select the Export option in File panel, and type in the file name "Spirits_model" ; select the output mode as Cult3D Designer (C3D), and single-click the "Save" button. Afterwards a Cult3D dialog box will pop out, requiring you to unfold the Materials nodes, and set the texture property of the shadow as Constant. Single-click the Apply

button, and press Save button to save the file in CED. Now we can resume the works in Cult3D Designer.

Interactive Processing on Cult3D Designer

Cult3D Designer is a virtual-reality 3D imaging software developed by Cycore (Sweden), a high performance tool with superior capabilities in interactivity, file size and imaging quality, and a popular choice among its similar. The 3D-based technology of Cult3D makes it possible for viewers to view the product from all aspects.[3] Cult3D is compatible with the models generated by 3DSMAX and MAYA. The user may add interactive features in the model on Cult3D Designer, generate 3D images accessible from the internet, and control the 3D products to rotate, zoom-in or zoom-out on web pages, allowing the viewer to experience the properties of the created object in a highly visualized manner. The user may also add sound effects and operational guides to the Cult3D-edited objects, and introduce the output into Word, PowerPoint and Acrobat. A plug-in called Cult3D Exporter for 3DMAX is required to output the 3DSMAX-edited files into C3D format, which can be accessed through Cult3D Designer.

The Java-based kernel of Cult3D offers powerful interactivity, allowing the user to conduct basic interactive presentation on Cult3D Designer, and compile the model in JavaScript directly through the Cult3D API developing program. [4]

The procedure of interactive editing on Cult3D Designer is presented hereunder:

- 1) Initiate Cult3D, and select " File →Add Cult3D Designer File ". Then select "Spirits_model.c3d" in the pop-out open-file dialog box;.
- 2) Drag the World Start event in the Event Map window to the margin to the right, and create a new World Start_1 event;
- 3) Select the Action window, and unfold the Object Motion node; drag the Arcball icon to the event World Start_1, and then release the mouse button to create a link between the event and the icon;
- 4) Select the Scene Graph window to unfold the RootNode, and drag the Bottle icon to overlap the Arcball icon in the Event Map window;
- 5) Single-click the Run button in the previewing window to pivot the bottle as you wish, viewing the model from all aspects. viewing the model from all aspects.(Fig.2)

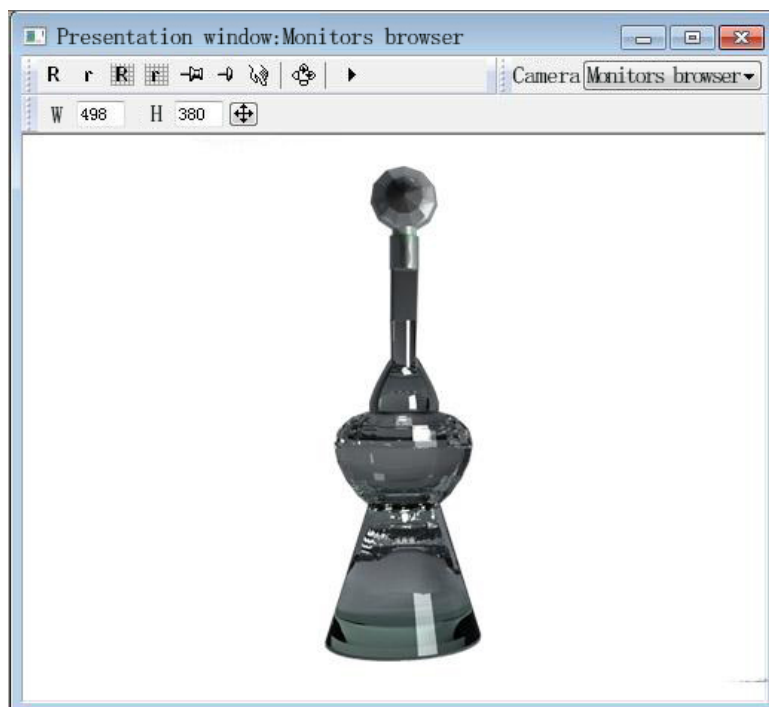


Fig.2 Interactive Editing on Cult3D Designer

The following issues should be noted when using Cult3D Designer:

1) Currently the modeling of geometric polygons are supported by Cult3D, and those without a polygon structure will first be transformed into a polygon. Considering the internet downloading time, it would be wise to control the number of polygons of the scene in general, particularly no more than 30,000 faces in total;

2) Currently Cult3D supports only the Standard and Multi/Sub-Object textures of 3D Studio Max, which is enough for the rendering of textures like metal, plastic or painting for large objects, although more work is needed in rendering the effects of polished metals and glass;

3) Currently the setup of customized lighting is unavailable for Cult3D. The light is casted ahead in front of the camera;

4) Cult3D with its high capacity is able to save the footages of multiple cameras, along with their positions and critical motion frames. But these cameras can only be activated one camera at a time. The user may switch between cameras in "select camera Action".

Internet Virtual Presentation and Remote Interactive Experience through DreamweaverMX

DreamweaverMX is a visualized webpage design tool, developed particular for professional webpage designers, which can be used to create dynamic trans-platform and trans-browser webpages easily. Cult3D with a Java kernel can be used to compile the objects in JavaScript through Cult3D API when undertaking complicated design works. The user may use the more familiar Web interfaces to control the shape, attitude and behavior of the Cult3D object, allowing the viewers to learn the appearance properties of the model, and intensifying the visual effects of the object in 3Ds.

The shared JavaScript resources are bounty. The user may run a string of JavaScript codes when defining a customizable function or upon the occurrence of an event. The procedure the author performs to call the Cult3D behavior language is presented as follow:

1) Decompose the executive commands in Cult3D;

2) Define the name of each calling command;

3) Write in the calling command in Dreamweaver to adept the defined command name;

4) After calling, perform the visualized input of motions and virtual dynamic presentation in the webpage.

The user may use the following codes to complete the calling of Cult3D in Dreamweaver MX. Type in the following codes before </head>:

```
<SCRIPT LANGUAGE="javascript" SRC="cult3d.js"> </SCRIPT>
```

```
<script language="javascript" for="CultObject" event="OnLoadFinished" type="text/javascript">
```

```
<!--
```

```
if(isActiveX())
```

```
{
```

```
finishedLoading(this);
```

```
}
```

```
//-->
```

```
</script>
```

```
<script language="javascript" for="CultObject" event="OnSendMessage" type="text/javascript">
```

```
<!--
```

```
if(isActiveX())
```

```
{
```

```
messageSent();
```

```

}
// - - >
</SCRIPT>
<SCRIPT LANGUAGE="javascript">
<!--
var Cult3D;
var isLoading=false;
function finishedLoading(refObject){
if(typeof(Cult3D)!="object")
{
return;
}
... ..etc.
</script>

```

Press the linkage button and type in the following codes:

```
<a href="javascript:void(0);"onClick="triggerCommand(' 1step')">step1</a>
```

The user may use the above codes for the internet virtual presentation of packaging products in webpages.(Fig.3)

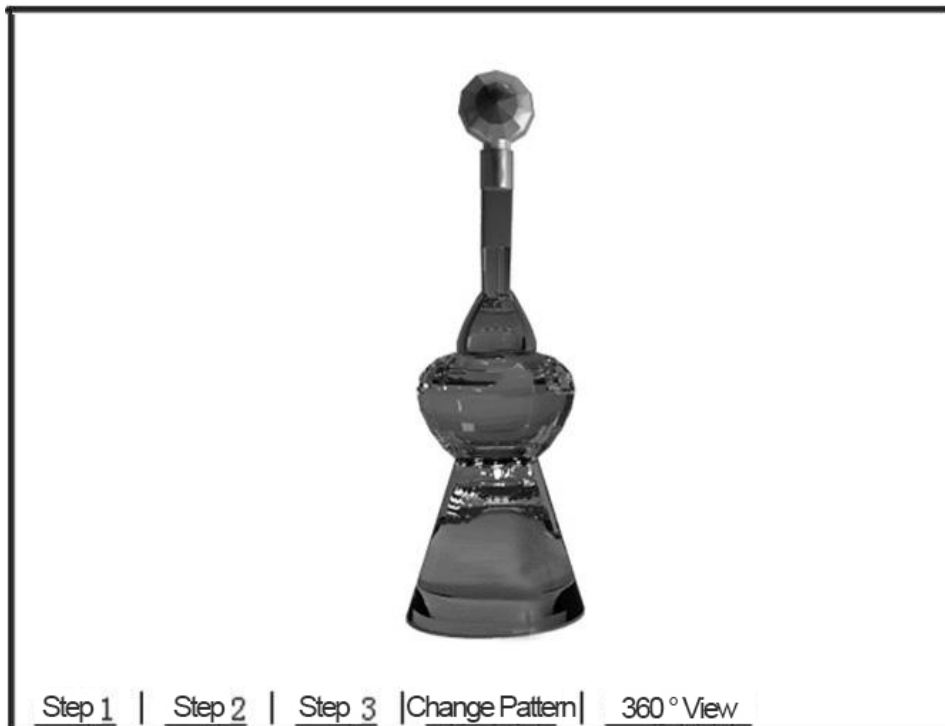


Fig.3 Packaging products in webpages

Conclusion

The progressing information technology has posed higher demand on remote virtual presentation and experience-based consumption of packaging products. Virtual reality technology is a great leap in the visualization and interactivity of packaging design^[5] It is foreseeable that the developing virtual reality technology and the mature internet technology will further stretch the limit of customer satisfaction, and the interactive digital technology will bridge the enterprises closer to their users.

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