シノハラメソッドによる

米国特許公報から論理的学術文体を学びとる

３×３のマトリックス
ＵＳＰ　６７７３１４９
（ 米国･ＧＥ社出願 ）

日本アイアール株式会社
知的財産活用研究所

もくじ

はじめに

1．3個のモジュール（3欄）

すべての文章は、三個のモジュール（module）に区切られています．すなわち、表示上は、三つの欄に区切られています．

2．3種の表現

すべての文章は、以下の3種の文章のどれかに分類されています．

（1）　ＶＡ　サブジクト（Subject）の属性を記述する

サブジェクト（Ｓ）	Ｖ（動詞）	‘Ｓ（サブジェクトの属性記述）

（2）　ＶＳ　サブジェクトが置かれている状態、あるいはサブジェクトがオブジェクトを持たずに、自分だけで行為している状態を記述する

サブジェクト（Ｓ）	Ｖ　状態を表わす動詞部 又は 自動詞	Ｍ　（Modifier）状態をさらに詳細に述べる修飾部

＊動詞部は斜字体（イタリック）で表記されています．

（3）　ＶＴ　サブジェクトからオブジェクトへの働きかけを記述する

サブジェクト（Ｓ）	Ｖ　他動詞	Ｏ　オブジェクト（Object）

＊動詞部には、下線（アンダーライン）が付されています．

3．　3Ｘ3のマトリックス

すべての文章は、3個のモジュール（欄）から成り立ち、3種の文章のどれかに属するということから、これを「3Ｘ3」のマトリックスと呼んでいます．

4．コンポーネント（component）

モジュールは1個あるいは複数のコンポーネントで構成されています．ここでは、煩雑にならない限り、コンポーネントに分けて表記されています．

5．柱の単語（メインワード、メインプレイヤー）

（1）ＶＡの文章では3個、（2）ＶＳの文章では2個、（3）ＶＴの文章では3個、その文章の構造上の柱となる単語が存在します．それらは、一つ大きなポイントで表示されています．

6．骨組み文章（基本文章、Basic Sentence）

記述内容において、その文章の主要部分、あるいは基本部分を構成しているコンポーネントが存在します．それらは太字（ボールド）で表示されています．
＊もちろん、短い文章の場合は、全文が基本文章の場合があります．

6．効果

上記の表示方法により、以下のような効果が得られるはずです：
（1）　文章の構造が容易に理解でき；
（2）　記述の論理関係が正確に読み取れ；
（3）　主要部分のみ把握していくことで早く読み取れ；
（4）　英文の記述の順序どおりに、コンンポーネントごとに処理していくことに慣れることによって、自然に、英語で表現する力（書く、話す）と聴き取る力がついていく．

7．日本語訳

（1）　モジュール：

元の英文に対応した形で、日本語直訳が付されており、同様に3個のモジュールに分けて表示されています．ただし、日本語は、動詞部が文末に来るため、その部分で英文とは順序が入れ替わっています．

（2）　コンポーネント：

同じく元の英文に対応した形でコンポーネントに分けて訳が表示されています．ただし、日本語では、枝葉の事柄から記述していくために、表示の順序は英文とほぼ逆になっています．

（3）　骨組み文章：

元の英文に対応した形で、骨組みの文章部分は、太字（ゴシック体）で表示されています．

8．日本語訳の効果

以上の表示により、英文のコンポーネントとそれに対応する日本語訳を容易に付き合わせることができ、英文の流れを損なうことなく、また、そこでの主張の仕方などを理解しながら、記述内容の理解の支援として、この日本語訳は利用できるはずです．

United States Patent 6,773,149
August 10, 2004

Method, system and computer product

for predicting headlamp reflector temperature

Inventors: Kulkarni; Anant (Maharashtra, IN); Jaarda; Eric (Ann Arbor, MI); Wilson; James (Troy, MI); Liang; Erwin (Ballston Lake, NY)
Assignee: General Electric Company (Pittsfield, MA)
Appl. No.: 248083
Filed: December 17, 2002

Abstract

001 . . . .

A method for predicting headlamp reflector temperature
comprising
receiving a headlamp type
and
transmitting a request
for an input parameter value
responsive to the headlamp type.

前照灯の型を受信すること、
及び
前照灯の型に対応しての
入力パラメータ値への
要請を伝送することで 構成されている
前照灯の反射鏡の温度を予測する方法

＊アブストラクトの最初の文章は、ここでの様に、しばしば、動詞部を持たない、つまり文法の構造上は「文章」ではない、表題（タイトル）的記述が見られます．

A method for predicting headlamp reflector temperature comprising receiving a headlamp type and transmitting a request for an input parameter value responsive to the headlamp type.

002 VS…………………………………………………………………………………………………..

The input parameter value
is received ***in*** **response to transmitting the request.**

入力パラメータ値は
要請を伝送することに応じて
受信される．

The input parameter value is received in response to transmitting the request.

003 VS…………………………………………………………………………………………………..

A transfer function*
is executed ***in*** **response to the input parameter and the headlamp type**
and
the execution
results ***in*** **a predicted* maximum reflector temperature.**

移転機能は 入力パラメータ及び前照灯の型に応じて
実行され、

そして
その実行は　予測された最大の反射鏡温度と
なる．
＊「transfer」の原義は「移転」です．この仕様書では、パラメータ値やランプの型に応じて予測温度に「転換」する働きを述べているようです．ここでの「発明」のポイントです．
＊「predict」のもともとの意味は、"前もって述べる"、つまり"予告する"ことですが、ここでは「予測する」と、とりあえず訳してあります．最大温度を前もって知る、というのがここでの発明のポイントですから、訳語にとらわれずに内容を理解してください．
A transfer function is executed in response to the input parameter and the headlamp type and the execution results in a predicted maximum reflector temperature.
004　VS……………………………………………………………………………………………….
The predicted maximum reflector temperature
Is then output.
反射鏡の予測された最大の温度が　次いで、出力される．
＊どこに出力されるのか記述されていないので、不完全な記述ですが、ここはアブストラクトの記述であるからと、とりあえず納得しておきます．
The predicted maximum reflector temperature is then output.

Description

BACKGROUND OF INVENTION

005　VS……………………………………………………………………………………………..
The present disclosure
relates generally
to **a method** for predicting headlamp reflector temperature
and in particular,
to **a method** for predicting the maximum temperature
on automotive headlamp reflectors.
ここでの開示は
前照灯の反射鏡の温度を予測するための方法に
全般的には、関するものであり、
そして特定すれば、
自動車の前照灯反射鏡上の
最大温度を予測するための方法に
（関するものである）．
The present disclosure relates generally to a method for predicting headlamp reflector temperature and in particular, to a method for predicting the maximum temperature on automotive headlamp reflectors.
006　VS. . . . .
A variety of thermoplastic materials
are available
in **the marketplace**
for use in automotive lighting systems.
様々な加熱可塑材が
自動車の照明システム用に、
市場で　入手可能である．
A variety of thermoplastic materials are available in the marketplace for use in automotive lighting systems.

007 VA…………………………………………………………………………………………………

A basic criterion for material selection
in lighting systems
is **heat resistance**
and in general,
the higher the heat resistance, *
the higher the cost of the thermoplastic. *

照明システムにおいて、
材料の選択における基本的な評価基準（項目）は
耐熱性 であり、
そして一般的には、
耐熱性の度合が高ければ高いほど
加熱可塑材のコストは高い．

＊この文章の末尾部分は、見られるように、動詞部が存在せず、従って文章の構造を取っていません．一般文章では不思議ではない記述ですが、パテント文章では、まれにしか見られない書き方と言えるでしょう．つまり、好ましくない文章と言えるでしょう．

A basic criterion for material selection in lighting systems is heat resistance and in general, the higher the heat resistance, the higher the cost of the thermoplastic.

008 VA…………………………………………………………………………………………………

Heat resistance
is **the maximum temperature**
(＊in which)
the components
can sustain indefinitely
without degradation of function.

耐熱性とは コンポーネントが
機能の低下を招かずに、
いつまでも耐えられる
最大温度のこと
である．

＊「in which**」或いは「**that**」が構造上は欠けているので、読解支援のために編集者が挿入しました．ここでのように関係代名詞が省略されているのは、一般文章では極めて通常のことです．**
＊「heat resistance**」の定義が、この文章でなされています．**

Heat resistance is the maximum temperature the components can sustain indefinitely without degradation of function.

009 VT…………………………………………………………………………………………………

If
the component
is a headlamp reflector,
the maximum temperature of the reflector
can* be affected*
by design considerations
such as reflector diameter, bulb diameter, bulb depth, lens depth, spacer depth and reflector depth.

もし、
コンポーネントが
前照灯反射鏡 であれば、
反射鏡の最大温度は
例えば、反射鏡の直径、電球の直径、電球の厚さ、レンズの厚さ、

スペーサーの厚さ、反射鏡の厚さなどの
設計上の考慮によって　影響を受ける（可能性がある）．

＊ここでの「can」は、「if」を受けて、何々という条件なら、何々である、という不確実性を示しています．日本語ではこれに直接対応する言葉が無いので、（　）で注釈風に示しました．

＊能動態文章では「Design considerations **affect** the maximum temperature.」で、「affect」はここでは他動詞ですから下線を付しました．

If the component is a headlamp reflector, the maximum temperature of the reflector can be affected by design considerations such as reflector diameter, bulb diameter, bulb depth, lens depth, spacer depth and reflector depth.

＊サブステージ（従属節）を導く機能記号（ここでは「if」）は、上例のように三つのモジュールのいずれにも属さない存在ですから、白抜きで囲ってあります．

010　VT…………………………………………………………………………………………………

Predicting the maximum temperature
for use in the selection of materials
in lighting applications,
such as the headlamp reflector material,
can* involve
detailed fluid dynamics *
and heat transfer analysis
for a particular configuration**.**

例えば前照灯反射鏡の材料といった
照明用途における
材料の選択に利用する目的で
最大温度を予測することは
特定の仕様において
詳細な流体力学と
熱伝導分析を　　　　　おこなうことになる（巻き込む場合もある）．

＊この「can」は、断定を避けて記述するために使われていると見なしました．

Predicting the maximum temperature for use in the selection of materials in lighting applications, such as the headlamp reflector material, can involve detailed fluid dynamics and heat transfer analysis for a particular configuration.

011　VS……………………………………………………………………………………………..

The process of performing
detailed fluid analysis*and heat transfer analysis
for each configuration
in order to determine the maximum temperature
on the reflector (hot spot)
can be cumbersome
and time consuming

反射鏡上（ホットスポット）の
最大温度を判定するために、
それぞれの仕様に対して
詳細な流体分析と熱伝導分析を
実行するプロセスは　　　　　　　扱いにくく、また時間がかかる．

＊０１０の「fluid dynamics」と、ここでの「fluid analysis」が、同じ意味で使われているのであれば、どちらかの言葉に統一すべきでしょう．パテント仕様書では、定義すること無しに、類似の言葉を用いることは、避けるべきとされています．

The process of performing detailed fluid analysis and heat transfer analysis for each configuration in order to determine the maximum temperature on the reflector (hot spot) can be cumbersome and time consuming.

012 VS…………………………………………………………………………………………………….

Estimating the maximum temperature accurately

is important

***in* order to avoid the expense and time**

associated with re-creating thermoplastic molding tools and processes.

最大温度を正確に見積ることは

加熱可塑材モールディングツールとプロセスの再製造に伴う

費用と時間を避けるために

重要である．

Estimating the maximum temperature accurately is important in order to avoid the expense and time associated with re-creating thermoplastic molding tools and processes.

SUMMARY OF INVENTION

013 VA. . . . .

One aspect of the invention

is a method

for predicting headlamp reflector temperature.

発明の一つの面は

前照灯反射鏡の温度を予測するための

方法 である．

One aspect of the invention is a method for predicting headlamp reflector temperature.

014 VT……………………………………………………………………………………………………..

The method

comprises receiving a headlamp type

and

transmitting a request

for an input parameter value

responsive to the headlamp type.

その方法は 前照灯の型を受信すること、

及び

前照灯の型に応じての

入力パラメータ値への

要請を伝送することで 構成する．

＊００１に内容は同じ．ここでは、「comprise」が原動詞で、文章の構造になっています．

The method comprises receiving a headlamp type and transmitting a request for an input parameter value responsive to the headlamp type.

015…………………………………………………………………………………………………….…

＊００２に同じ：つまり、アブストラクトの文章は、ここから転用されていることになります．以下も同じです．

The input parameter value is received in response to transmitting the request.

016……………………………………………………………………………………………………..

＊００３に同じ

A **transfer function** is executed in response to the input parameter and the headlamp type and the execution results in a predicted maximum reflector temperature.

017……………………………………………………………………………………………………

＊００４に同じ

＊ここでは、誰に、どのようにして「output」されるのかは記述されていません．文章０３４でそれが示されています．

The predicted maximum reflector temperature is then output.

018　VA．．．

Another aspect of the invention

is　　a method of creating a transfer function*

for calculating a predicted maximum reflector temperature.

発明のもう一つの面は

予測された反射鏡最大温度を算定するするための

移転機能を創生する方法

である．

＊ヘッドランプのタイプとそれに関するパラメータに基づいて計算して、最大温度を算定する機能を、ここでは「transfer function」と名づけられているようです．つまり、ある値を別の範疇の値に「transfer 転換する」機能と解釈できます．データや値を他のそれに「転換する」機能のようですから「転換機能」と訳した方が良いのかもしれません．

Another aspect of the invention is a method of creating a transfer function for calculating a predicted maximum reflector temperature.

019　VT………………………………………………………………………………………………….

The method　　comprises receiving

a headlamp application group

including a member.

この方法は　（群内の）構成員を含んでいる

前照灯用途群を

受信することで　　構成する．

The method comprises receiving a headlamp application group including a member.

020　VS…………………………………………………………………………………………………

The member

is classified

based on geometric primitives

and

the classification

results　　***in* a headlamp type.**

構成員は　外形基本図に基づいて

分類され、

そして

分類は　　前照灯の型に　　帰結する．

The member is classified based on geometric primitives and the classification results in a headlamp type.

021　VS……………………………………………………………………………………………..

Key* material and geometric parameters

that affect a predicted maximum reflector temperature

for the headlamp type

are identified.

前照灯の型に関連する

予測された反射鏡の最大温度に影響するところの、

鍵となる材質及び外形パラメータが

識別される．

＊「key」は「parameters」の修飾と判断しました．つまり「key material」ではなく．このように名詞や形容詞を多く連結して記述すると、表現が曖昧になることがあり、要注意であることがこの例でも分かりま

す．

＊文章の末尾が動詞部で終っており、誰によって、あるいはどのような状況の下で識別されるのかが不明の記述ですから、これだけを見れば、良い文章とは言えないでしょう．但し、サマリー部の記述にはしばしばこのような不完全な記述が見られます．どこで、どのようになどの具体的な記述は、以下の詳細説明部分でなされています．

Key material and geometric parameters that affect a predicted maximum reflector temperature for the headlamp type are identified.

022 VS……………………………………………………………………………………………….

A simple parametric geometric model

is created

***responsive to* the key material and geometric parameters.**

単純なパラメータ式の外形モデルが

鍵となる材質と外形パラメータに対応して

創生される．

A simple parametric geometric model is created responsive to the key material and geometric parameters.

023 VS……………………………………………………………………………………………..

A design space

is set ***for* the key material and geometric parameters.**

設計空間が 鍵となる材質及び外形パラメータに対して

設定される．

A design space is set for the key material and geometric parameters.

024 VT………………………………………………………………………………………………..

The method

further comprises

creating a set of design of experiments

in response to the design space and the model.

この方法は 設計空間と（設計）モデルに対応しての

実験に関する設計一式を創生することを

更に、構成する．

The method further comprises creating a set of design of experiments in response to the design space and the model.

025 VS…………………………………………………………………………………………….

The set of design of experiments

is carried out

and

results ***in* output.**

実験に関する設計一式が 実行され

そして

出力と なる．

The set of design of experiments is carried out and results in output.

026 VS…………………………………………………………………………………………….

A transfer function

is derived ***to* calculate** the predicted maximum reflector temperature

for the headlamp type responsive to the output.

移転機能が 出力に応じての前照灯の型に対しての

予測された反射鏡の最大温度を計算するために

引き出される．（導き出される）

A transfer function is derived to calculate the predicted maximum reflector temperature for the headlamp type responsive to the output.

027 VS……………………………………………………………………………………………..

The predicted maximum reflector temperature

varies

in response to an input parameter.

予測された反射鏡の最大温度は

入力パラメータに応じて

変化する．

The predicted maximum reflector temperature varies in response to an input parameter.

028 VA. . . . .

Another aspect of the invention

is **a system**

for predicting headlamp reflector temperature.

発明のもう一つの面は

前照灯反射鏡の温度を予測するための

システム　　　　　　である．

Another aspect of the invention is a system for predicting headlamp reflector temperature.

029 VT…………………………………………………………………………………………….

The system

comprises **a network,**

a user system in communication with the network,

a storage device

and **a host system.**

システムは　　ネットワーク、

ネットワークシステムと通信するユーザーシステム、

蓄積保管装置、

及びホストシステムで　構成する．

The system comprises a network, a user system in communication with the network, a storage device and a host system.

030 VS & VT……………………………………………………………………………….

The host system

_is_ **_in_ communication with the network**

and

the storage device and the host system

includes **application software** to implement a method

comprising

receiving a headlamp type from the user system via the network.

ホストシステムは

ネットワークと通信する

状態にあり、

蓄積保管装置とホストシステムは

ネットワークを介してユーザーシステムから前照灯の型を受信することで

構成している

方法を組み込むためのアプリケーションソフトウエアを

含む．

The host system is in communication with the network and the storage device and the host system includes application software to implement a method comprising receiving a headlamp type from the user system via the network.

031 VT……………………………………………………………………………………………..

The **method**
further **comprises**
transmitting a request
across the network
for an input parameter value
responsive to the headlamp type.

その方法は　前照灯の型に応じての
入力パラメータ値に関する要請を
ネットワークを全体を通して
伝送することで　更に、構成する.

The method further comprises transmitting a request across the network for an input parameter value responsive to the headlamp type.

032　VS…………………………………………………………………………………………..

The input parameter **value**
is received *from* the user system
via the network
in response to transmitting the request.

入力パラメータ値は
ネットワークを介して、
要請を伝送することに応じて
ユーザーシステムから　受信される.

The input parameter value is received from the user system via the network in response to transmitting the request.

033　VS………………………………………………………………………………………….

A transfer **function** *stored on the storage device
is executed
in response to the input parameter and the headlamp type

and

the **execution**
results *in* a predicted maximum reflector temperature.

蓄積保管装置に蓄積された移転機能は
入力パラメータ及び前照灯の型に応じて
実行され、
その実行は　予測された反射鏡の最大温度と
なる.

＊００３及び０１６に「stored on the storage device」が追加されています.
＊「機能」が装置に「蓄積保管」されるという表現はおかしいので、この「transfer function」は「移転機能体」或いは「移転函数」とでも呼ぶべき物であることが、ここでの記述になって、始めて分かるようになります.

A transfer function stored on the storage device is executed in response to the input parameter and the headlamp type and the execution results in a predicted maximum reflector temperature.

034　VS…………………………………………………………………………………………..

The predicted maximum reflector **temperature**
is then output
to the user system
via the network*.

予測された反射鏡の最大温度が
ネットワークを介して
ユーザーシステムに

次いで、出力される．

＊００４及び０１７に「to the user system via the network」が追加されおり、ここで始めてどこに、何を通してアウトプットされるのかが分かります．文章としてもこれで整いました．

The predicted maximum reflector temperature is then output to the user system via the network.

035 VA．．．

A further **aspect** of the invention
is
a computer program **product**
for predicting headlamp reflector temperature.

発明の更なる面は
前照灯反射鏡の温度を予測するための
コンピュータプログラム製造物
である．

A further aspect of the invention is a computer program product for predicting headlamp reflector temperature.

036 VT…………………………………………………………………………………………………..

The computer program **product**
comprises
a storage **medium** readable by a processing circuit
and
storing **instructions** for execution by the processing circuit
for performing a method.

コンピュータプログラム製造物は
処理回路によって読み込み可能な蓄積媒体と、
方法を実現するための
処理回路によって実行される蓄積命令で
構成する．

The computer program product comprises a storage medium readable by a processing circuit and storing instructions for execution by the processing circuit for performing a method.

037 ……

The method comprises receiving a headlamp type and transmitting a request for an input parameter value responsive to the headlamp type.

＊この文章は０１４に同じです．ここで突然メソッドの話になるのは、０３６の「for performing a method」を受けて、そのメソッドは以下の通り、と引き続き説明しているわけです．

038 ＊０１５に同じ…………………………………………………………………………………..

The input parameter value is received in response to transmitting the request.

039 ＊０１６に同じ…………………………………………………………………………………..

A transfer function is executed in response to the input parameter and the headlamp type and the execution results in a predicted maximum reflector temperature.

040 ＊０１７に同じ…………………………………………………………………………………..

The predicted maximum reflector temperature is then output.

041 VS．．．

Further **aspects** of the invention
are disclosed herein.

本発明の更なる面は ここにおいて、開示されている．

Further aspects of the invention are disclosed herein.

042 VT…………………………………………………………………………………………………

The above **discussed**
and other **features** and **advantages** of the invention
will be **appreciated**

and **understood**

by those skilled in the art

from the following detailed description and drawings.

上記で討議されたこと、

及び本発明の他の特徴及び利点は

以下の詳細説明と図面から

この技術における熟練者（当業者）によって、

評価され、理解されるだろう．

＊サマリーを締めくくる場合の常套文章パターンです．

The above discussed and other features and advantages of the invention will be appreciated and understood by those skilled in the art from the following detailed description and drawings.

BRIEF DESCRIPTION OF DRAWINGS

043 ……………………………………………………………………………………………………….

Referring to the exemplary drawings

wherein

like elements

are numbered alike

in the several FIGURES:

代表的な図面が示されている

そこにおいて

同様の構成要素は

幾つかの図面の中で　同じように番号が付されている．

＊内容記述文章ではなく、注意書きです．

Referring to the exemplary drawings wherein like elements are numbered alike in the several FIGURES:

044　VA……………………………………………………………………………………………..

FIG. 1　**is**　**a block diagram *of an exemplary process***

to create a calculator

for predicting headlamp reflector temperature;

図1は　前照灯反射鏡の温度を予測するためにある

計算機能体を創生するための

代表的なプロセスのブロック図

であり；

FIG. 1 is a block diagram of an exemplary process to create a calculator for predicting headlamp reflector temperature;

045　VA……………………………………………………………………………………………..

FIG. 2　**is**　**an example of the geometry**

that could be associated with a fog lamp;

図2は　霧用ランプに関係する（であろう）

外形の例　であり；

FIG. 2 is an example of the geometry that could be associated with a fog lamp;

046　VA……………………………………………………………………………………………

FIG. 3　**is**　**an example of a simplified parametric model**

for the fog lamp depicted in FIG. 2;

図3は　図2で描かれた霧用ランプのための、

単純化されたパラメータモデルの例

であり；

FIG. 3 is an example of a simplified parametric model for the fog lamp depicted in FIG. 2;

047 VA……………………………………………………………………………………………….

FIG. 4 **is** **a block diagram of an exemplary process**
for utilizing a calculator
to predict headlamp reflector temperature;

図4は 前照灯反射鏡温度を予測するために、
計算機能体を活用するための
代表的なプロセスのブロック図
であり；

FIG. 4 is a block diagram of an exemplary process for utilizing a calculator to predict headlamp reflector temperature; and

048 VA……………………………………………………………………………………………….

and

FIG. 5 **is** **a block diagram of an exemplary system**
for predicting headlamp reflector temperature.

図5は 前照灯反射鏡温度を予測するための
代表的なシステムのブロック図
である．

FIG. 5 is a block diagram of an exemplary system for predicting headlamp reflector temperature.

DETAILED DESCRIPTION

049 VT. . . . .

An embodiment of the present invention
includes **several complimentary* components**
that can be utilized to rapidly provide
a prediction of hot-spot temperatures for headlamps,
bypassing the need
for many man days of finite element modeling
and many hours of computer processing unit time.

本発明の実施例は
微細な要素をモデリングするのに多くの人月と
多くのコンピュータの処理ユニット時間が
必要とされることを避けながら、
前照灯のホットスポット温度の予測を
素早く提供するために利用される
幾つかの（xxxxxx？）＊コンポーネントを
含む．

＊「complimentary」は、意味不明です．

An embodiment of the present invention includes several complimentary components that can be utilized to rapidly provide a prediction of hot-spot temperatures for headlamps, bypassing the need for many man days of finite element modeling and many hours of computer processing unit time.

050 VS……………………………………………………………………………………………….

Various lamps
are characterized
into general classes
according to their basic shape.

様々なランプが

それらの基本形状に従っての
一般的分類の中に
特徴付けされている.
Various lamps are characterized into general classes according to their basic shape.
051 VS…………………………………………………………………………………………………

For example,
fog lamps
can be characterized
into teardrop, round, square and oval.
例えば、
霧用ランプは
涙形、円形、四角形および楕円形として
特徴付けられている(されうる).
For example, fog lamps can be characterized into teardrop, round, square and oval.
052 VT………………………………………………………………………………………………..

Each class
is then parameterized
by assigning suitable geometric primitives
that
both approximate the basic shape
and
which can be varied more or less independently.
それぞれの分類は
両方が基本形状に近似の、
そして、
その形状は多かれ少なかれ個別に異なっているところの、
適切な外形基本図を指定することによって
次いでパラメータ化される.
＊少し難しい文書ですが、「that」**以下は、**「both」**がミニサブジェクト、**「approximate」**がその動詞(自動詞)、**「the basic shape」**がその修飾部と解釈します.**
Each class is then parameterized by assigning suitable geometric primitives that both approximate the basic shape and which can be varied more or less independently.
053 VS…………………………………………………………………………………………………

An experimental design
is created ***for*** **each class**
that outlines
what range of parameters and bulb wattages
should be fully explored
to adequately describe each class.
実験用の設計が
各分類を適切に記述するために
パラメータと電球のワット数の領域が
どこまで充分に探査さるべきであるかを
概述しているところの
それぞれの分類において
創生される.
An experimental design is created for each class that outlines what range of parameters and bulb wattages should be fully explored to adequately describe each class.
054 VS………………………………………………………………………………………………..

Next,

the experiments specified in the experimental design

are carried out

***by* calculating** via three-dimensional fluid dynamics,

the hot-spot temperature of each parameterized design/wattage combination

indicated by the design experiment.

次いで、

実験用設計の中で特定化された実験(複数)が

実験用設計で示されている

それぞれパラメータ化された設計又はワット数組み合わせのホットスポットの温度を、

三次元流体力学を介して計算することで

実行される．

Next, the experiments specified in the experimental design are carried out by calculating, via three-dimensional fluid dynamics, the hot-spot temperature of each parameterized design/wattage combination indicated by the design experiment.

055 VS……………………………………………………………………………………….

The results of the experiments

are fed back

***through* a statistical experimental analysis**,

and

the significant parameters

are culled *

and

the transfer functions

that relate the hot-spot temperature to those significant parameters

are derived.

実験の結果(複数)は

統計的な実験分析を通して

フィードバックされ、

そして、

重要なパラメータが 選別され、

そして、

ホットスポット温度をそれらの重要なパラメータに関連付ける

移転函数が 引き出される．

The results of the experiments are fed back through a statistical experimental analysis, and the significant parameters are culled and the transfer functions that relate the hot-spot temperature to those significant parameters are derived.

056 VT……………………………………………………………………………………………

A user

can access **the hot-spot calculator**

through a graphical user interface

that is customized

to accept the headlamp class and the significant parameters.

ユーザーは 前照灯分類と重要なパラメータを受け付けるべく

カストマイズされている

GUI を通して

ホットスポット計算機能体に

アクセスできる．

A user can access the hot-spot calculator through a graphical user interface that is customized to accept the headlamp class and the significant parameters.

057　VS & VA……………………………………………………………………………………………..

The **class** and **parameters**

are fed ***as*** **inputs** to the previously derived transfer functions

and

the resulting **output**

is a predicted hot-spot **temperature,**

or* maximum temperature.

分類項とパラメータは

前もって引き出された移転函数への入力（値）として

供給され,

そして

結果としての出力は

予測されたホットスポット温度、

すなわち最大温度　　　である．

＊「or」は、「あるいは」か「すなわち」かは不明です．直前にコンマがあるので、ここでは「すなわち」としました．このように曖昧になるので「or」の使用は要注意です．

The class and parameters are fed as inputs to the previously derived transfer functions and the resulting output is a predicted hot-spot temperature, or maximum temperature.

058　VS………………………………………………………………………………………………..

The **calculator**

can be deployed

in **a variety of manners**

Including:

web deployed, personal digital assistant deployed,

and personal computer deployed.

計算機能体は

応用されたウエブ、応用された PDA**、応用された** PC **を含む**

様々な形式で　　　　応用される（されうる）．

The calculator can be deployed in a variety of manners Including: web deployed, personal digital assistant deployed, and personal computer deployed.

059　．．．

FIG. 1 is a block diagram of an exemplary process to create a calculator for predicting headlamp reflector temperature.

＊０４４に同じ

060　VS……………………………………………………………………………………………

At step 102,

the **headlamps** within an application group

are classified

based on geometric primitives,

resulting in headlamp types.

ステップ１０２において、

用途群内の前照灯は

前照灯の型で体現される

外形基本図に基づいて

分類される．

At step 102, the headlamps within an application group are classified based on geometric primitives, resulting in headlamp types.

061 VS……………………………………………………………………………………………

For example,

in the case of automotive lighting applications,

there

are

several application groups

such as fog lamps and motorcycle lamps

that can be further broken down and classified

based on their geometric primitives

into headlamp types (e.g., round, square, oval).

例えば、

自動車両の照明応用の場合では、

前照灯の型、（例えば、円形、四角形、楕円形）に帰着する

外形基本図に基づいて

さらに細分化され分類される

例えば霧用ランプ、オートバイ用ランプなどの

幾つかの応用群が　　　　　　　　存在する．

For example, in the case of automotive lighting applications, there are several application groups such as fog lamps and motorcycle lamps that can be further broken down and classified based on their geometric primitives into headlamp types (e.g., round, square, oval).

062 VS……………………………………………………………………………………………..

A variety of thermoplastic materials

are available

***from* resin manufacturers** for use in automotive lamps.

様々な加熱可塑材料が

自動車ランプ用として樹脂製造業者から

入手可能である．

A variety of thermoplastic materials are available from resin manufacturers for use in automotive lamps.

063 VT……………………………………………………………………………………………..

A key criteria

for selecting a particular thermoplastic material

from the group of available thermoplastic materials

includes **the heat resistance**

required by the automotive lamp

and

the heat resistance

provided by the particular thermoplastic material.

入手可能な加熱可塑材料群から

特定の加熱可塑材料を選別するための

主要評価基準は

自動車のランプに必要な

耐熱性、

及び、

特定の加熱可塑材料で提供された

耐熱性を　　　　　　　含む．

A key criteria for selecting a particular thermoplastic material from the group of available thermoplastic materials includes the heat resistance required by the automotive lamp and the heat resistance provided by the particular thermoplastic material.

064 VS……………………………………………………………………………………………..

The effect of varying geometric and material parameters
on the required heat resistance
(also referred to as the hot-spot temperature)
in automotive lamps

can be categorized

based on geometric primitives.

自動車ランプにおける
必要な耐熱性
（ホットスポット温度とも呼ばれている）に関する
変化する外形及び材質パラメータの効果は

外形基本図に基づいて 分類される（されうる）．

The effect of varying geometric and material parameters on the required heat resistance (also referred to as the hot-spot temperature) in automotive lamps can be categorized based on geometric primitives.

065 VT……………………………………………………………………………………………

Geometric primitives

dictate

the shape of the automotive lamp

(e.g., round, teardrop, square).

外形基本図は

（例えば、円形、涙形、四角形といった）
自動車ランプの形状を

定める．

Geometric primitives dictate the shape of the automotive lamp (e.g., round, teardrop, square).

066 VS……………………………………………………

Next,

at step 104,

the key material and geometric parameters
affecting the temperature on the reflector surface

are identified

***for* a particular class of headlamps**
within an application group.

次いで、

ステップ１０４において、

反射鏡表面上の温度に影響を与えている
鍵となる材質及び外形パラメータは

用途群の内での
前照灯の特別の分類として

識別認証される．

Next, at step 104, the key material and geometric parameters affecting the temperature on the reflector surface are identified for a particular class of headlamps within an application group.

067 VT……………………………………………………………………………………………

For example,

a lamp in the fog lamp application group
with a round classification

may include

geometric parameters
such as
reflector diameter, reflector depth and wattage of the bulb.

例えば
円形型分類での
霧ランプ用途群におけるランプは
例えば、反射鏡直径、反射鏡厚さ及び電球のワット数などの、
外形パラメータを
含む（場合がある）．
For example, a lamp in the fog lamp application group with a round classification may include geometric parameters such as reflector diameter, reflector depth and wattage of the bulb.
068 VT…………………………………………………………………………………………..
Material parameters
may include
thermal conductivity of material
and
emissivity of reflective coating.
材質パラメータは
材料の熱伝導性
及び
反射塗布の放射性率を
含む（場合がある）．
Material parameters may include thermal conductivity of material and emissivity of reflective coating.
069 VS…………………………………………………………………………………………..
At step 106,
a simple parametric geometric model
is created utilizing the parameters.
ステップ１０６において、
単純なパラメータ的外形モデルが
パラメータを用いて 創生される．
At step 106, a simple parametric geometric model is created utilizing the parameters.
070 VT…………………………………………………………………………………………….
This simple parametric geometric model
covers almost all headlamps
in the classification group
by varying the key parameters.
この単純なパラメータ的外形モデルは
鍵となるパラメータを多様にしている
分類群の中の
ほとんどすべての前照灯に
対応している．
This simple parametric geometric model covers almost all headlamps in the classification group by varying the key parameters.
071 ……………………………………………………………………………………………….
See FIG. 3,
below,
for an example of a parametric model
for a round fog lamp.
以下の図３を参照のこと、
円形の霧用ランプにおいてのパラメータモデルの例として
＊注意書きです．

See FIG. 3, below, for an example of a parametric model for a round fog lamp.
072 VS…………………………………………………………………………………………..

The intended design space,
or parameter range,
is set ***at*** **step 108.**
意図された設計空間、
すなわちパラメータ範囲が
ステップ108で 設定されている．
The intended design space, or parameter range, is set at step 108.
073 VS………………………………………………………………………………………….

At step 110,
a design of experiments (DOE)
is created ***for*** **the parametric geometric model.**
ステップ110において、
実験用設計(DOE)が
パラメータ的外形モデルとして
創生される．
At step 110, a design of experiments (DOE) is created for the parametric geometric model.
074 VT…………………………………………………………………………………………..

The DOE **includes** **a number of experiments**
based on possible combinations
of geometric, material and process parameters.
DOE は
外形、材料、及びプロセスパラメータの
可能な組合せに基づいての
幾つかの実験を 含む．
The DOE includes a number of experiments based on possible combinations of geometric, material and process parameters.
075 VS………………………………………………………………………………………….

The DOE ***can be created***
using an automated tool
(e.g., Design for Six Sigma from Minitab, Inc.,
Regression, Response Surface Methodology from Minitab, Inc.).
DOE は (例えばミニタブ社のシックスシグマの設計、
ミニタブ社の回帰、応答、表面方法論などの)
自動化されたツールを用いて
創生される．
The DOE can be created using an automated tool (e.g., Design for Six Sigma from Minitab, Inc., Regression, Response Surface Methodology from Minitab, Inc.).
076 VT………………………………………………………………………………………….

Inputs to the DOE tool
include **the simple parametric geometric model,**
the intended design space
and the parameters.
DOE ツールへの入力物は
単純なパラメータ的外形モデル、
意図された設計空間
及びパラメータを 含む．
Inputs to the DOE tool include the simple parametric geometric model, the intended design

space and the parameters.
077 VT…………………………………………………………………………………………………….

The output from the DOE tool
Includes **a set of experiments**
that will cover the design space
and
that should be performed
in order to determine an associated transfer function
that correlates the parameters to the temperature
on the reflector surface.

DOE **ツールからの出力は**
設計空間をカバーするであろう
実験一式を
そして、
反射鏡表面上の温度に対するパラメータを
互いに関連付けるところの、
関連する移転函数を判定するために
遂行されるべきである
実験一式を　　含む.

The output from the DOE tool Includes a set of experiments that will cover the design space and that should be performed in order to determine an associated transfer function that correlates the parameters to the temperature on the reflector surface.

078 VS. . . . .

At step 112,
the set of experiments
described by the output of the DOE tool
is performed.

ステップ112において、
DOE **ツールの出力によって記述された**
実験一式が　　遂行される.

At step 112, the set of experiments described by the output of the DOE tool is performed.

079 VS.…………………………………………………………………………………………………

In an exemplary embodiment,
the experiments
are carried out
utilizing heat transfer and flow analysis simulation tools
(i.e., computational fluid dynamics)
to determine the temperature distribution on the reflector surface.

代表的な実施例において、
実験は　反射鏡表面上の温度の分布を判定するための
熱転移とフロー分析シミュレーションツール
(すなわち演算型流体力学)
を利用しながら　　遂行される.

In an exemplary embodiment, the experiments are carried out utilizing heat transfer and flow analysis simulation tools (i.e., computational fluid dynamics) to determine the temperature distribution on the reflector surface.

080 VS.…………………………………………………………………………………………………….

Thermal prediction software
(e.g., FLUENT from Fluent, Inc.)

is utilized ***to* conduct these experiments**
in a virtual environment.
（**例えば　フルーエント社の** Fluent）
熱予測ソフトウエアが
仮想の環境において
それらの実験を導くために
利用される．
Thermal prediction software (e.g., FLUENT from Fluent, Inc.) is utilized to conduct these experiments in a virtual environment.
081 VS…………………………………………………………………………………………….
When
all of the experiments
have been completed,
or simulated,
a transfer function
is derived ***at* step 114**
using the results of the experiments.
全ての実験が　完了したとき、
あるいはシミュレートされたとき、
移転函数が　実験の結果を利用しながら
ステップ114において
引き出される．
When all of the experiments have been completed, or simulated, a transfer function is derived at step 114 using the results of the experiments.
082 VS……………………………………………………………………………………………
The resulting transfer function
relates **input parameters**
(all or a subset of the key parameters
in the simple parametric geometric model)
to the temperature on the reflector surface.
結果としての移転函数は
（単純なパラメータ的外形モデルの中の、
鍵となるパラメータの全てあるいはサブセットである）
入力パラメータを
反射鏡表面の温度に　関連付ける．
The resulting transfer function relates input parameters (all or a subset of the key parameters in the simple parametric geometric model) to the temperature on the reflector surface.
083 VS…………………………………………………………………………………………….
The transfer function
is created **using a separate regression analysis tool**
(e.g., Minitab from Minitab, Inc.).
移転函数が　（例えばミニタブ社のミニタブという）
別の回帰分析ツールを用いて
創生される．
The transfer function is created using a separate regression analysis tool (e.g., Minitab from Minitab, Inc.).
084 VS……………………………………………………………………………………………
Alternatively,
the transfer function

is created using the DOE tool.
あるいは別の（やり方として）、
移転函数が DOE ツールを用いて 創生される
Alternatively, the transfer function is created using the DOE tool.
085 VT…………………………………………………………………………………………………..
The transfer function
relates the response variable (the maximum temperature)
to the key parameters considered for the DOE.
移転函数は 反応変動値（最大温度）を
DOE に対して考慮された鍵となるパラメータに
関連付ける．
The transfer function relates the response variable (the maximum temperature) to the key parameters considered for the DOE.
086 VS……………………………………………………………………………………………………
The derived transfer function
is then utilized
for calculating the maximum temperature
on the reflector surface.
引き出された移転函数は
反射鏡表面上の
最大温度を計算するために
次いで、利用される．
The derived transfer function is then utilized for calculating the maximum temperature on the reflector surface.
087 VS…………………………………………………………………………………………………..
Geometric and material parameter values
for specific customer applications within the design space
are input *to* the transfer function
via the calculator.
設計空間内の特定の顧客用途に向けての
外形及び材料パラメータ値が
計算機能体を経由して
移転函数に 入力される．
Geometric and material parameter values for specific customer applications within the design space are input to the transfer function via the calculator.
088 VS……………………………………………………………………………………………………
A different transfer function
is derived *for* each class of headlamp,
or
for each parametric geometric model created in step 106.
異なる移転函数が
前照灯の各分類に対して、
すなわち、
ステップ１０６で創生された各パラメータ的外形モデルに対して
引き出される．
A different transfer function is derived for each class of headlamp, or for each parametric geometric model created in step 106.
089 VS…………………………………………………………………………………………………..
In an exemplary embodiment,

the transfer **function**

is stored ***in* a database of transfer functions**
that are indexed by headlamp classification
within an application group.

代表的な実施例として、
移転函数は　用途群の中において
前照灯分類によって索引化された
移転函数データベース内に
蓄積される.

In an exemplary embodiment, the transfer function is stored in a database of transfer functions that are indexed by headlamp classification within an application group.

090 VS………………………………………………………………………………………………..

The processing described in FIG. 1

is repeated
***for* each headlamp classification** defined in step 102
and
***for* headlamps** in the other application groups
based on implementation requirements.

図1で記述された処理が
ステップ102で定義された各前照灯分類毎に、
そして
組込み要求に基づいての
その他の用途群における前照灯においても
繰り返される.

The processing described in FIG. 1 is repeated for each headlamp classification defined in step 102 and for headlamps in the other application groups based on implementation requirements.

091 VA. . . . .

FIG. 2 **is** **an example of the geometry**
that is associated with a fog lamp,
one of the application groups for automotive headlamps.

図2は　自動車の前照灯の用途群のひとつであるところの、
霧用ランプに関連した
外形図の例　である.

FIG. 2 is an example of the geometry that is associated with a fog lamp, one of the application groups for automotive headlamps.

092 VT………………………………………………………………………………………………….

The headlamp

includes **a bulb, a reflector, a lens, a decorative bezel and a housing unit.**

前照灯は　電球、反射鏡、レンズ、装飾的ベゼル、及び筐体を
含む.

The headlamp includes a bulb, a reflector, a lens, a decorative bezel and a housing unit.

093 VS………………………………………………………………………………………………..

As shown in FIG. 2,

the fog lamp

is ***four and a half inches high,***
four inches wide,
and two and seven sixteenths inches deep.

図2に示されているように、

霧用ランプは

高さ 4.5 インチ、

幅 4 インチ、

奥行き 2 と 16 分の 7 インチ

である．

As shown in FIG. 2, the fog lamp is four and a half inches high, four inches wide, and two and seven sixteenths inches deep.

094 VS………………………………………………………………………………………………..

Additionally,

the fog lamp depicted in FIG. 2

***is classified as* a round fog lamp.**

追記すれば、

図2で描かれている霧用ランプは

円形型ランプとして 分類されている．

Additionally, the fog lamp depicted in FIG. 2 is classified as a round fog lamp.

095 VA. . . . .

FIG. 3 is a simplified parametric model

associated with the fog lamp

depicted in FIG. 2.

図3は 図2で描かれた

霧用ランプに関連した

単純化されたパラメータモデル

である．

FIG. 3 is a simplified parametric model associated with the fog lamp depicted in FIG. 2.

096 VS………………………………………………………………………………………………..

The parameters depicted in FIG. 3

can be utilized

***to* create the hot-spot calculator.**

図3で描かれたパラメータは

ホットスポット計算機能体を創生するために

利用される（されうる）．

The parameters depicted in FIG. 3 can be utilized to create the hot-spot calculator.

097 VS………………………………………………………………………………………………

In addition,

several of the parameters depicted in FIG. 3

may be input

***to* the hot-spot calculator**

in order to predict a maximum reflector temperature.

更に、

図3で描かれている幾つかのパラメータは

反射鏡の最大温度を予測するために、

ホットスポット計算機能体に

入力される（だろう）．

In addition, several of the parameters depicted in FIG. 3 may be input to the hot-spot calculator in order to predict a maximum reflector temperature.

098 VT………………………………………………………………………………………………..

The basic geometric primitives

for this parametric model

include: circular arc 314, parabolic curve 316

(note that
the reflector is generally, but not necessarily parabolic,
and that
other shapes, for example a polyelipsoid
can also be employed in an alternate embodiment)
and
right angle cylinder 320.

基本の外形基本図は
円弧 314、**放物線状曲線** 316、
及び直角シリンダ３２０を
含む：

（注意；
反射鏡は、一般的に、しかし必須ではなく、放物線状である、
そしてその他の形状は、例えばポリエリプソイドも、
他の可能な実施例として、採用されうる）

The basic geometric primitives for this parametric model include: circular arc 314, parabolic curve 316 (note that the reflector is generally, but not necessarily parabolic, and that other shapes, for example a polyelipsoid can also be employed in an alternate embodiment) and right angle cylinder 320.

099 VS……………………………………………………………………………………………….

The fog lamp application group
can be broken down
***into* classes** based on these basic geometric primitives
and
can result ***in* classes**
such as teardrop shaped, round and square
depending on the values of the geometric primitives.

霧用ランプ用途群は
これらの基本的な外形基本図に基づいて、
幾つかの分類に　　　細分化される（されうる）．
そして
外形基本図の値に基づいて、
たとえば涙形、円形および四角形という
分類と　　　　　　なる(なりうる)．

The fog lamp application group can be broken down into classes based on these basic geometric primitives and can result in classes such as teardrop shaped, round and square depending on the values of the geometric primitives.

100 VA……………………………………………………………………………………………….

Also shown *in FIG. 3
are **parameters**
that may affect the temperature of the reflector in a fog lamp
including
reflector diameter 302, lens depth 304, spacer depth 306, reflector depth 308, bulb diameter 310, bulb depth 312.

図３で同じく示されているのは
霧用ランプ内の反射鏡の温度に
影響を与えるかもしれない
パラメータ　　　　　であり、
（そのパラメータは）反射鏡直径３０２、スペーサー奥行き３０６、反射鏡奥行き３０８、

電

球直径３１０、電球奥行き３１２を

含む．

＊文法上は「shown」がサブジェクトであり、間違いは無いのですが、特許明細書では、やはり、「図３で示されている XXX は、パラメータである」と、本当のサブジェクト XXX を記述すべきところです．

Also shown in FIG. 3 are parameters that may affect the temperature of the reflector in a fog lamp including reflector diameter 302, lens depth 304, spacer depth 306, reflector depth 308, bulb diameter 310, bulb depth 312.

101 VT………………………………………………………………………………………………….

In addition,

the wattage of the bulb 318

will also have

an effect on the temperature of the reflector.

それに加えて、

電球のワット３１８のワット数は

反射鏡の温度に影響を

これまた与える（だろう）．

In addition, the wattage of the bulb 318 will also have an effect on the temperature of the reflector.

102 VA……………………………………………………………………………………………..

These are the variables

that will be tested through the DOE process

and may be reflected in the resulting transfer function

depending on the results of the DOE.

これらは DOE プロセスを通してテストされるであろう、

また、DOE の結果によるところの

移転函数の結果に反映されるであろう

可変値 である．

These are the variables that will be tested through the DOE process and may be reflected in the resulting transfer function depending on the results of the DOE.

103 VS………………………………………………………………………………………………….

For other application groups (e.g., high beam lamps)

other geometric primitives and parameters

may be utilized

to **describe** the application group and the associated classes.

その他の用途群（たとえば、ハイビームランプ）に対しては、

その他の外形基本図とパラメータが

利用群とそれに伴う分類を記述するために

利用される（だろう）．

For other application groups (e.g., high beam lamps) other geometric primitives and parameters may be utilized to describe the application group and the associated classes.

104 VA. . . . .

FIG. 4 is a block diagram of an exemplary process

for utilizing a calculator to predict headlamp reflector temperature.

図４は 前照灯の反射鏡温度を予測するために計算機能体を利用する

代表的なプロセスのブロック図

である．

FIG. 4 is a block diagram of an exemplary process for utilizing a calculator to predict headlamp reflector temperature.

105 VT…………………………………………………………………………………………………

The **process** depicted in FIG. 4

includes **a user**

accessing the hot-spot calculator

from a user system or from a hand held device.

図4で描かれたプロセスは

ユーザーシステムあるいは携帯装置から、

ホットスポット計算機能体にアクセスしている

ユーザーを 含む.

The process depicted in FIG. 4 includes a user accessing the hot-spot calculator from a user system or from a hand held device.

106 VT…………………………………………………………………………………………………

At step 402,

the **user** **selects** a **type** of headlamp

which includes selecting an application group

(e.g., fog lamps, motorcycle lamps)

and

within the application group

a particular **classification**

(e.g., round, square, teardrop shape).

ステップ402において、

ユーザーは

(たとえば、霧用ランプ、オートバイランプといった)

用途群を選ぶことを含めて

前照灯の型を 選び、

また、用途群内においては、

(例えば円形、四角形、涙形といった)

特定の分類を 選ぶ.

At step 402, the user selects a type of headlamp which includes selecting an application group (e.g., fog lamps, motorcycle lamps) and within the application group a particular classification (e.g., round, square, teardrop shape).

107 VT………………………………………………………………………………………………..

At step 404,

the **user** **enters** input parameter data **values**

in response to a prompt from the calculator.

ステップ404において、

ユーザーは 計算機能体からのプロンプトに応じて、

入力パラメータデータ値を

入れる.

At step 404, the user enters input parameter data values in response to a prompt from the calculator.

108 VT…………………………………………………………………………………………………

Parameter **values**

include **values** for the key parameters

that were determined to have an impact

on the reflector temperature

during the DOE process.

パラメータ値は DOE **プロセスの期間中に、**

反射鏡の温度に
影響を持つとすでに判定された
鍵となるパラメータに対しての値を
含む.

Parameter values include values for the key parameters that were determined to have an impact on the reflector temperature during the DOE process.

109 VT…………………………………………………………………………………………………

Next,
step 406 *is performed*
and
the hot-spot calculator
calculates **the maximum heat on the reflector**
using the transfer function
developed as described in reference to FIG. 1.

次いで、
ステップ406が 実行され、
そして、
ホットスポット計算機能体は
図1の引用として記述されているように開発された
移転函数を用いて
反射鏡上の最大熱を 計算する.

Next, step 406 is performed and the hot-spot calculator calculates the maximum heat on the reflector using the transfer function developed as described in reference to FIG. 1.

110 VT………………………………………………………………………………………………...

Based on the results of the transfer function,
the calculator, at step 408,
selects, or recommends,
a thermoplastic material
with an adequate heat resistance rating.

移転函数の結果に基づいて、
計算機能体は
ステップ408において、
適切な耐熱度合を有している
加熱可塑材料を 選択あるいは推奨する.

＊「recommend」の後の「コンマ」は誤りで削除すべきです.

Based on the results of the transfer function, the calculator, at step 408, selects, or recommends, a thermoplastic material with an adequate heat resistance rating.

111 VS, VT & VS, VT……………………………………………………………………………..

The calculator
can be vendor specific
and recommend
a thermoplastic material that the vendor produces
or
it *could be vendor independent*
and
include **thermoplastic materials** from several vendors.

計算機能体は メーカー仕様 である（ありうる）、
そして メーカーが製造している加熱可塑材料を
推奨し、

あるいは、
それ（計算機能体）は
メーカーから独立　　したものである(ありうる)
そして、
幾つかのメーカー製の加熱可塑材料を
含む．

The calculator can be vendor specific and recommend a thermoplastic material that the vendor produces or it could be vendor independent and include thermoplastic materials from several vendors.

112　VA………………………………………………………………………………………….

For example,
the **result** of step 406
may **be** that
the maximum heat on the reflector
is one hundred and ninety degrees Celsius.

例えば、
ステップ４０６の結果は
反射鏡上の最大温度は摂氏１９０度である
ということに　　　なる（場合もある）．

For example, the result of step 406 may be that the maximum heat on the reflector is one hundred and ninety degrees Celsius.

113　VT………………………………………………………………………………………...

Then,
at step 408,
the **calculator**
would **suggest**
a thermoplastic **material** with a maximum heat capacity
that exceeds one hundred and ninety degrees Celsius.

次いで、
ステップ４０８において、
計算機能体は
摂氏１９０度を超えての
最大の温度許容度を持った加熱可塑材料を
示唆する(だろう)．

Then, at step 408, the calculator would suggest a thermoplastic material with a maximum heat capacity that exceeds one hundred and ninety degrees Celsius.

114　VT………………………………………………………………………………………..

At step 410,
the **calculator**
displays the suggested **material**
and **results** of the transfer function.

ステップ４１０において、
計算機能体は　示唆された材料、
及び移転函数の結果を
表示する．

At step 410, the calculator displays the suggested material and results of the transfer function.

115　VT………………………………………………………………………………………..

The **user** can **perform**
this **process**,

from step 402 through 410,
any number of times
and **can use** **this data**
as input to the design process.

ユーザーは　ステップ４０２から４１０までの
このプロセスを、
何度でも、　遂行でき,、
そして　設計プロセスへの入力(値)として
このデータを　利用できる.

The user can perform this process, from step 402 through 410, any number of times and can use this data as input to the design process.

116 VA. . . . .

FIG. 5 is **a block diagram of an exemplary system**
for predicting headlamp reflector temperature.

図５は　前照灯反射鏡の温度を予測するための
代表的なシステムのブロック図
である.

FIG. 5 is a block diagram of an exemplary system for predicting headlamp reflector temperature.

117 VT……………………………………………………………………………………………...

The system of FIG. 5
depicts **how**
a user (e.g., a designer, a field engineer, an external customer)
can make a request,
through a user system 502
(e.g., a personal computer, a host attached terminal)
or a hand held device 510 (e.g., a personal digital assistant)
to an application program on the host system 504
to access the calculator
for predicting headlamp reflector temperature.

図５のシステムは
前照灯反射鏡温度を予測する目的で
計算機能体にアクセスするために
ホストシステム５０４上のアプリケーションプログラムへ、
（例えば PC、ホストに接続された端末機といった）ユーザーシステム５０２を通して
あるいは携帯装置５１０（例えば PDA）を通して、
（例えば設計者、保守技術者、外部の客といった）ユーザーが
どのようにして
要請を作り出すかを　描いている.

＊このように長い文章の場合は、骨組み部分（ボールドで示されている）を見極めて読めば、読解が滑らかに行えるはずです.「The system of FIG. 5 depicts how a user can make a request to an application program.」

The system of FIG. 5 depicts how a user (e.g., a designer, a field engineer, an external customer) can make a request, through a user system 502 (e.g., a personal computer, a host attached terminal) or a hand held device 510 (e.g., a personal digital assistant) to an application program on the host system 504 to access the calculator for predicting headlamp reflector temperature.

118 VS……………………………………………………………………………………………..

The users ***can be physically located***
***in* one or more geographic locations**

and ***can be directly connected***

***to* the host system 504**

or ***coupled*** ***to* the host system** via the network 506.

ユーザーは　一つあるいはそれ以上の地理的位置に

物理的に位置しており

そして　ホストシステム５０４に　直接つながっており

あるいは

ネットワーク５０６を介してホストシステムに

接続されている．

The users can be physically located in one or more geographic locations and can be directly connected to the host system 504 or coupled to the host system via the network 506.

119　VT & VS……………………………………………………………………………………………

In an exemplary embodiment,

the host system 504

executes **programs** that provide access to the calculator

for predicting headlamp reflector temperature

and

data relating to the temperature prediction(e.g., transfer functions*)*

are stored ***on* the storage device 508** attached to the host system.

代表的実施例において、

ホストシステム５０４は

前照灯反射鏡温度を予測する目的で

計算機能体にアクセスすることを提供しているプログラムを

実行する．

そして

温度予測に関係するデータ（例えば移転函数）は

ホストシステムに付属した蓄積装置５０８上に

蓄積される．

In an exemplary embodiment, the host system 504 executes programs that provide access to the calculator for predicting headlamp reflector temperature and data relating to the temperature prediction (e.g., transfer functions) are stored on the storage device 508 attached to the host system.

120　VS……………………………………………………………………………………………………

Each user system 502 and hand held device 510

may be implemented

using a general-purpose computer

executing a computer program for carrying out the processes

described herein.

それぞれのユーザーシステム５０２及び携帯装置５１０は

ここにおいて記述されている

プロセスを遂行するためのコンピュータプログラムを実行する

汎用コンピュータを用いて

設置される（されうる）．

Each user system 502 and hand held device 510 may be implemented using a general-purpose computer executing a computer program for carrying out the processes described herein.

121　VT…………………………………………………………………………………………………..

If

the user system 502 or hand held device 510

includes　a personal computer,

the processing described herein

may be shared

by a user system 502 or hand held device 510 and the host system 504

by providing an applet to the user system 502.

もし、

ユーザーシステム５０２と携帯装置５１０が

パソコンを　　　　　　含むならば

ここにおいて記述されているプロセスは

ユーザーシステム５０２にアップレットを提供することでもって

ユーザーシステム５０２あるいは携帯装置５１０とホストシステム５０４によって

分担される（されうる）.

If the user system 502 or hand held device 510 includes a personal computer, the processing described herein may be shared by a user system 502 or hand held device 510 and the host system 504 by providing an applet to the user system 502.

122　VA. . . . .

The network 506

may be　　any type of known network

including

a local area network (LAN), a wide area network (WAN), an intranet, or a global network (e.g., Internet).

ネットワーク５０６は

LAN、WAN、イントラネット、あるいはグローバルネット（例えばインターネット）含む

公知のどのようなネットワークでも

ありうる.

The network 506 may be any type of known network including a local area network (LAN), a wide area network (WAN), an intranet, or a global network (e.g., Internet).

123　VS……………………………………………………………………………………………..

A user system 502 or hand held device 510

may be coupled

to the host system 504

through multiple networks (e.g., intranet and Internet)

so that

not all user systems 502 and hand held devices 510

are required

to be coupled to the host system 504

through the same network.

ユーザーシステム５０２あるいは携帯装置５１０は

複数のネットワーク（例えばイントラネットとインターネット）を通して、

ホストシステム５０４に　接続されており、

それゆえに

全てのユーザーシステム５０２及び携帯装置５１０が

同じネットワークを通して、

ホストシステム５０４に接続されていることが

必要とされるわけではない.

A user system 502 or hand held device 510 may be coupled to the host system 504 through multiple networks (e.g., intranet and Internet) so that not all user systems 502 and hand held devices 510 are required to be coupled to the host system 504 through the same network.

124　VS & VA…………………………………………………………………………………….

One or more of the user systems 502, hand held device 510 and host system 504

may be connected

***to* the network 506**in a wireless fashion

and

the network 506

may be **a wireless network.**

一つあるいはそれ以上のユーザーシステム５０２、携帯装置５１０及びホストシステム５１０は

無線方式によってネットワーク５０６に

接続されており（かも知れない）、

そして

ネットワーク５０６は

無線ネットワーク　であリえる．

One or more of the user systems 502, hand held device 510 and host system 504 may be connected to the network 506 in a wireless fashion and the network 506 may be a wireless network.

125 VS. . . . .

The host system 504

may be implemented

using a server operating

in response to a computer program

stored in a storage medium accessible by the server.

ホストシステム５０４は

サーバーからアクセスできる蓄積媒体に蓄積されている

コンピュータプログラムに応じての

サーバーオペレーションを用いて

設置される(されうる)．

The host system 504 may be implemented using a server operating in response to a computer program stored in a storage medium accessible by the server.

126 VS…………………………………………………………………………………………...

The host system 504

may operate

***as* a network server** (often referred to as a web server)

to communicate with the user systems 502 and hand held device 510.

ホストシステム５０４は

ユーザーシステム５０２と携帯装置５１０と通信する、

（しばしばウエブサーバーと呼ばれる）ネットワークサーバーとして

働く（場合もある）．

The host system 504 may operate as a network server (often referred to as a web server) to communicate with the user systems 502 and hand held device 510.

127 VT………………………………………………………………………………………….

The host system 504

handles **sending and receiving information**

to and from user systems 502 and hand held devices 510,

and **can perform**

associated tasks.

ホストシステム５０４は

ユーザーシステム５０２と携帯装置５１０へとそこからの

情報の送信と受信を　扱い、

そして
関連する仕事を　　　遂行する（だろう）．
The host system 504 handles sending and receiving information to and from user systems 502 and hand held devices 510, and can perform associated tasks.
128　VT……………………………………………………………………………………………..
The host system 504
may also include
a firewall
to prevent unauthorized access to the host system 504
and enforce* any limitations on authorized access.
ホストシステム５０４は
ホストシステム５０４への承認されていないアクセスを防ぐために、
また、承認されているアクセスにも制限を加えるために、
防火壁（ファイヤーウヲール）を
含む（場合もある）．
＊「enforce」は「to prevent」と同格の「to enforce」です．
The host system 504 may also include a firewall to prevent unauthorized access to the host system 504 and enforce any limitations on authorized access.
129　VS．．
The host system 504
also operates
as an application server.
ホストシステム５０４は
アプリケーションサーバーとしても
働く．
The host system 504 also operates as an application server.
130　VT……………………………………………………………………………………………...
The host system 504
executes　one or more application programs
to create and implement the calculator
for predicting headlamp reflector temperature.
ホストシステム５０４は
前照灯反射鏡温度を予測するための
計算機能体を創生し組み込むために、
一つあるいはそれ以上のアプリケーションプログラムを
実行する．
The host system 504 executes one or more application programs to create and implement the calculator for predicting headlamp reflector temperature.
131　VT…………………………………………………………………………………………….
In an alternate embodiment,
the host system 504
includes　application programs
to implement the calculator
for predicting headlamp reflector temperature
and
the application programs
to create the calculator
reside remotely from the host system 504.
代わりとなる他の実施例において、

ホストシステム５０４は
前照灯反射鏡温度を予測用の
計算機能体を組み込むための
アプリケーションプログラム、
及び、
ホストシステム５０４から離れたところに位置する、
計算機能体を創生するための
アプリケーションプログラムを
含む．

In an alternate embodiment, the host system 504 includes application programs to implement the calculator for predicting headlamp reflector temperature and the application programs to create the calculator reside remotely from the host system 504.

132 VT……………………………………………………………………………………………….

Processing
may be shared
by the user system 502 and/or hand held device 510 and the host system 504.

処理は
ユーザーシステム５０２及び又は携帯装置５１０、及びホストシステム５０４によって
分担されうる．

Processing may be shared by the user system 502 and/or hand held device 510 and the host system 504.

133 VT…………………………………………………………………………………………...

Alternatively,
the user systems 502 and hand held device 510
may include
stand-alone software applications
for performing all or a portion of the processing
described herein.

その代わりとして、
ユーザーシステム５０２及び携帯装置５１０は
ここに置いて記述されている
処理の、すべてあるいはその一部を実行するためにの
スタンドアローンのソフトウエアアプリケーションを
含む（場合もある）．

Alternatively, the user systems 502 and hand held device 510 may include stand-alone software applications for performing all or a portion of the processing described herein.

134 VS………………………………………………………………………………………….

It ***is understood***
that
separate servers may be used
to implement the network server functions and the application server functions.

別々のサーバーが
ネットワークサーバー機能とアプリケーションサーバー機能を組み込むために
利用されうるという
そのことは 理解されるところである．

It is understood that separate servers may be used to implement the network server functions and the application server functions.

135 VS. . . . .

The storage device 508

may be implemented

using a variety of devices

for storing electronic information

such as a file transfer protocol (FTP) server.

蓄積装置508は

電子情報を蓄積するために、

例えば FTP **サーバーのような**

様々な装置を使用して　設置される（うる）.

The storage device 508 may be implemented using a variety of devices for storing electronic information such as a file transfer protocol (FTP) server.

136 VS & VA.…………………………………………………………………………………….

It ***is understood***

that

the storage device 508 may be implemented

using memory contained in the host system 504

or

it **may be** **a separate physical device.**

蓄積装置508は

ホストシステム504に含まれたメモリーを用いて

組み込まれうるという

そのことは　理解されうるし、

あるいは

それは　別の物理的な装置　でありうる.

It is understood that the storage device 508 may be implemented using memory contained in the host system 504 or it may be a separate physical device.

137 VT.……………………………………………………………………………………...

The storage device 508

contains **a variety of information**

relating to predicting headlamp reflector temperature

including

a database of transfer functions and associated parameters

for various classes of headlamps within application groups.

蓄積装置508は

用途群内の様々な分類上の前照灯についての

関連するパラメータや移転函数のデータベースを含む

前照灯の反射鏡温度を予測することに関係する

様々な情報を　含む.

The storage device 508 contains a variety of information relating to predicting headlamp reflector temperature including a database of transfer functions and associated parameters for various classes of headlamps within application groups.

138 VS& VT.…………………………………………………………………………………

The host system 504

may also operate

***as* a database server**

and

coordinate access to application data

including data stored on the storage device 508.

ホストシステム５０４は
データベースサーバーとして
また、働き、
そして
蓄積装置５０８に蓄積されているデータを含んでの、
アプリケーションデータへのアクセスを
調整する．

The host system 504 may also operate as a database server and coordinate access to application data including data stored on the storage device 508.

139 VS……………………………………………………………………………………………….

The data stored in the storage device 508
can be physically stored
as **a single database**
with access restricted based on user characteristics
or
it ***can be physically stored***
in **a variety of databases**
Including
portions of the database on the user systems 502, hand held device 510 and host system 504.

蓄積装置５０８に蓄積されているデータは
ユーザーの特徴に基づいての制限されたアクセスを伴う
単一のデータベースとして
物理的に蓄積され、
あるいは
それは ユーザーシステム５０２、携帯装置５１０及びホストシステム５０４上の
データベースの部分を含むところの、
様々なデータベースの中に
物理的に蓄積される

The data stored in the storage device 508 can be physically stored as a single database with access restricted based on user characteristics or it can be physically stored in a variety of databases including portions of the database on the user systems 502, hand held device 510 and host system 504.

140 VS. . . . .

An embodiment of the present invention
can be utilized
for **determining the maximum temperature of a component**
in a variety of lighting applications
and
is not limited ***to*** **automotive lighting**
nor to reflector components of lamps.

本発明の一つの実施例は
様々な照明用途においての
コンポーネントの最大温度を判定するために
応用され、
そして 自動車用照明にも、
ランプの反射鏡コンポーネントにも
限定されるものではない．

An embodiment of the present invention can be utilized for determining the maximum temperature of a component in a variety of lighting applications and is not limited to automotive lighting nor to reflector components of lamps.

141 VT…………………………………………………………………………………………………….

Types of lighting applications
that may utilize an embodiment of the present invention
include,
but
are not limited to:
fog lamps, car head lights, motorcycle lights, projector lamps,
industrial lighting and commercial lighting.

本発明の実施例を応用する
照明用途の種類は
霧用ランプ、自動車の前照灯、オートバイのランプ、プロジェクターのランプ、工業用照明、商業用照明を
含み、
しかし
（それらに）限られるものではない：

Types of lighting applications that may utilize an embodiment of the present invention include, but are not limited to: fog lamps, car head lights, motorcycle lights, projector lamps, industrial lighting and commercial lighting.

142 VS……………………………………………………………………………………………………..

In addition,
an embodiment of the present invention
can be expanded
***to* other design spaces**
and
is not limited
***to* lamps.**

加えるに、
本発明の一つの実施例は
その他の設計空間へ　拡張されうるし、
そして
ランプに　　　　　　限られるものではない.

In addition, an embodiment of the present invention can be expanded to other design spaces and is not limited to lamps.

143 VS……………………………………………………………………………………………………

For example,
embodiments of the present invention
may be utilized:
to perform thermal evaluation of electrical enclosures,
for structural evaluation of energy absorbing applications,
for evaluation of a simplified part manufacturing process,
and
to perform a quick evaluation
of the desired functionality of an application or product
with fair accuracy
before selecting an application or product
from a range available in the market.

例えば、

本発明の複数の実施例は

単純化された部品製造工程の評価として、
エネルギー吸収用途の構造的評価として、
電気 (製品) 筐体の熱評価の遂行に、
及び、
市場で入手できる範囲において、
アプリケーションや製品を選別する前に、
かなりの精度を持って、
アプリケーションや製品の望ましい機能性の
迅速な評価の遂行に

応用される.

For example, embodiments of the present invention may be utilized: to perform thermal evaluation of electrical enclosures, for structural evaluation of energy absorbing applications, for evaluation of a simplified part manufacturing process, and to perform a quick evaluation of the desired functionality of an application or product with fair accuracy before selecting an application or product from a range available in the market.

144 VS. . . . .

The methodology for developing the calculator

is based ***on* generating transfer functions**

that are derived from three-dimensional thermal analysis
of generic parametric models
representing configurations
currently utilized in lighting design.

計算機能体を開発する方法論は

照明設計において、現在応用されている
構成仕様を表わしている
根源的なパラメータ化されたモデルの、
三次元熱解析から引き出される
移転函数を生成することに

土台を置いている.

The methodology for developing the calculator is based on generating transfer functions that are derived from three-dimensional thermal analysis of generic parametric models representing configurations currently utilized in lighting design.

145 VS……………………………………………………………………………………………..

The simulation tools and statistical tools

used for the analysis
that are utilized to build the hot-spot calculator

are commercially available.

ホットスポット計算機能体を構築するためにに利用されるところの
解析に使用される
シミュレーションツールと統計ツールは

市場で入手可能である.

The simulation tools and statistical tools used for the analysis that are utilized to build the hot-spot calculator are commercially available.

146 VS…………………………………………………………………………………………..

Design of experiment (DOEs) techniques

are utilized

***in* order to derive the transfer functions.**

実験用設計 (DOE) テクニックが

移転函数を引き出すために
利用される．
Design of experiment (DOEs) techniques are utilized in order to derive the transfer functions.
147 VT…………………………………………………………………………………………………..
The use of the resulting hot-spot calculator
can reduce the time
required for the material selection process,
which in turn
can reduce product design cycle time.
結果としてのホットスポット計算機能体の利用は
材料選別工程に必要な
時間を 減少でき、
そのことは結果として
製品設計サイクル時間を
節約できることになる．
The use of the resulting hot-spot calculator can reduce the time required for the material selection process, which in turn can reduce product design cycle time.
148 VS…………………………………………………………………………………………………..
Design trade-off studies
can be carried out
***for* various lighting system shapes and parameters**
by utilizing the hot-spot calculator.
設計のトレードオフ（＊あれにするかこれにするかの）研究が
ホットスポット計算機能体を利用することで
様々な照明システムの形状とパラメータに対して
遂行されうる．
Design trade-off studies can be carried out for various lighting system shapes and parameters by utilizing the hot-spot calculator.
149
VT. . . . .
An embodiment of the present invention
provides for a method
to estimate the temperature of headlamp reflectors
that is completely based on transfer functions.
本発明の一つの実施例は
移転函数にまったく基づくところの、
前照灯反射鏡の温度を見積もるための
一つの方法を 提供する．
An embodiment of the present invention provides for a method to estimate the temperature of headlamp reflectors that is completely based on transfer functions.
150 VS & VT…………………………………………………………………………………………..
This *can result in* a quick estimate
that can be utilized at the conceptual level of design
and
can allow a designer
to obtain several estimates
and
use* the results
in creating the design of the headlamp.

これは　　　　　設計のコンセプチュアルレベルにおいて利用される
迅速な見積もりと　　　結果としてなりなり、
そして、
設計者をして
幾つかの見積もりを入手し、
また
前照灯のデザインを作り出すことにおいて
その結果を利用することを
可能にする．

＊「use」は「to obtain」と同列の、「to use」です．

This can result in a quick estimate that can be utilized at the conceptual level of design and can allow a designer to obtain several estimates and use the results in creating the design of the headlamp.

151　VS & VT…………………………………………………………………………………………….

An embodiment of the present invention
is web enabled
and
can be utilized
by field engineers, or authorized customers,
to assist customers
in making immediate material selection decisions
for specific applications.

本発明の一つの実施例は
特定のアプリケーーションに対して、
即座の材料選択決定を行うことで
顧客を支援するために、
保守技術者や認証された顧客によって
ウエブ上で可能であり、
利用されうる．

An embodiment of the present invention is web enabled and can be utilized by field engineers, or authorized customers, to assist customers in making immediate material selection decisions for specific applications.

152　VS…………………………………………………………………………………………………

Also,
the ability
to estimate the maximum temperature of a headlamp reflector
can result　***in*** **choosing the most economic thermoplastic material**
that meets the design requirements.

更にまた、
前照灯反射鏡の最大温度を見積もる
能力は　　　　　設計要求に合致する
もっとも経済的な加熱可塑材料を選択する
結果となる（ことができる）．

Also, the ability to estimate the maximum temperature of a headlamp reflector can result in choosing the most economic thermoplastic material that meets the design requirements.

153　VS…………………………………………………………………………………………………

This　***can also result***
in **eliminating costly rework**
to thermoplastic molding tools or processes.

これは　加熱可塑モールディングツールあるいはプロセスへの、
費用がかかる修理を排除する
結果ともなる（なりうる）．

This can also result in eliminating costly rework to thermoplastic molding tools or processes.

154 VS. . . . .

As described above,
the embodiments of the invention
may be embodied
in **the form of computer-implemented processes**
and
apparatuses for practicing those processes.

上に記述されているように、
本発明の実施例は
コンピュータを組み込んだプロセスの形で
及び
それらのプロセスを実行する装置の（形で）
実施されうる．

As described above, the embodiments of the invention may be embodied in the form of computer-implemented processes and apparatuses for practicing those processes.

155 VS.…………………………………………………………………………………………

Embodiments of the invention
may also be embodied
in **the form of computer program code**
containing instructions
embodied in tangible media,
such as floppy diskettes, CD-ROMs, hard drives,
or any other computer-readable storage medium,

wherein,
when
the computer program code
is loaded into
and executed by a computer,
the computer
becomes **an apparatus** for practicing the invention.

本発明の複数の実施例は
形ある媒体、例えば FD、CD-ROM、ディスク
あるいはその他のコンピュータで読み取れる蓄積媒体に
組み込まれた命令を含んでいる、
コンピュータプログラムコードの形で
また実施され（されうる）、

そこにおいて、
コンピュータプログラムコードが
（コンピュータの中に）　搭載され、
コンピュータによって　実行されるときに、
コンピュータは
本発明を実行する装置と
なる．

Embodiments of the invention may also be embodied in the form of computer program code containing instructions embodied in tangible media, such as floppy diskettes, CD-ROMs, hard drives, or any other computer-readable storage medium, wherein, when the computer program code is loaded into and executed by a computer, the computer becomes an apparatus for practicing the invention.

156 VS…………………………………………………………………………………………….

An embodiment of the invention
can also be embodied
in **the form of computer program code,**
for example
whether stored in a storage medium, l
loaded into and/or executed by a computer,
or transmitted over some transmission medium,
such as over electrical wiring or cabling,
through fiber optics,
or via electromagnetic radiation,
wherein,
when
the computer program code
is loaded *into*
and executed by a computer,
the computer
becomes **an apparatus** for practicing the invention.

本発明の実施例は
例えば、
蓄積媒体に蓄積されている、
コンピュータの中に搭載されている、
またあるいはコンピュータによって実行されている、
あるいは、
幾つかの伝送媒体を通して
例えば、電線あるいはケーブルを通して、
光ファイバーを通して、
あるいは電子磁気放射を介して、
伝送されていると、いった、
コンピュータプログラムコードの形で
また実施されうる.
そこにおいて、
コンピュータプログラムコードが
(コンピュータの中に) 搭載され、
コンピュータによって 実行されるときに、
コンピュータは
本発明を実行する装置と
なる.

An embodiment of the invention can also be embodied in the form of computer program code, for
example whether stored in a storage medium, loaded into and/or executed by a computer, or transmitted over some transmission medium, such as over electrical wiring or cabling, through fiber optics, or via electromagnetic radiation, wherein, when the computer program code is loaded into and executed by a computer, the computer becomes an apparatus for practicing the invention.

157 VT……………………………………………………………………………………………..

When implemented on a general-purpose microprocessor,

the computer program code segments

configure the microprocessor

to create specific logic circuits.

汎用マイクロプロセサに組み込まれるときに、

コンピュータプログラムコードセグメントは

特定の論理回路を生成する

マイクロプロセサを　　形づくる.

When implemented on a general-purpose microprocessor, the computer program code segments configure the microprocessor to create specific logic circuits.

158 VT. . . . .

While

the invention *has been described*

with reference to exemplary embodiments,

it will be understood

by those skilled in the art

that

various changes may be made

and equivalents may be substituted for elements thereof

without departing from the scope of the invention.

発明が　代表的な実施例への引用と伴に

記述された時に、

それは　この技術分野の熟練者によって

様々な変更がなされうることが、

そして同等のものが、

本発明の視野から離れることなく、

ここにおいての要素に代替されうることが

理解されるだろう.

While the invention has been described with reference to exemplary embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the invention.

159 VS.……………………………………………………………………………………………..

In addition,

many modifications

may be made

***to* adapt a particular situation or material**

to the teachings of the invention

without departing from the essential scope thereof.

加えるに、

多くの修正が　ここまでのところの本質的な視野から外れること無しに、

本発明の教えに合わせて

特別な状況や材料を

適応させるために　　なされるだろう.

In addition, many modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from the essential scope thereof.

160 VS.……………………………………………………………………………………………...

Therefore,

it *is intended* that

the invention

not be limited to the particular embodiment
disclosed as the best mode contemplated
for carrying out this invention,
but that
the invention
will include all embodiments
falling within the scope of the appended claims.

それゆえ、
それは　本発明は、
この発明を実行するに当たって
最良の態様として考察されて開示されている
特定の実施例に限られるものではないということが
意図されており、
つまり、
本発明は、
添付されたクレームの視野の内にある
全ての実施例を含むということが
ねらいとされている.

Therefore, it is intended that the invention not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this invention, but that the invention will include all embodiments falling within the scope of the appended claims.

161　VT…………………………………………………………………………………………………..

Moreover,
the use of the terms first, second, etc.
do not denote
any order or importance,
but rather
the terms first, second, etc.
are used ***to*** **distinguish one element from another.**

更に、
第1とか第2などの言葉の使用は
等級や重要度を　意味するものではなく、
むしろ
第1、第2などの言葉は
一つの要素を他のそれから区別するために
使用されている.

Moreover, the use of the terms first, second, etc. do not denote any order or importance, but rather the terms first, second, etc. are used to distinguish one element from another.

Claims

What is claimed is:

1.

A method for predicting headlamp reflector temperature,
the method comprising:

receiving	**a headlamp type;**
transmitting	**a request** for an input parameter value
	responsive to said headlamp type;
receiving	**said input parameter value**
	in response to said transmitting a request;
executing	**a transfer function**
	in response to said input parameter and said headlamp type,
said executing	resulting in a predicted maximum reflector temperature;
and	
outputting	**said predicted maximum reflector temperature.**

前照灯反射鏡温度を予測する方法、
この方法は　　　　（以下でもって）構成する：

前照灯複数型を	**受信すること；**
前記前照灯型に対応する	
入力パラメータ値への要請を	**伝送すること；**
前記要請の伝送に対応しての	
前記入力パラメータ値を	**受信すること；**
前記入力パラメータと前記前照灯型に対応しての	
移転函数を	**実行すること、**
その実行は予測された反射鏡最大温度と	**なる；**
及び	
前記予測された反射鏡最大温度を	**出力すること．**

What is claimed is:
A method for predicting headlamp reflector temperature, the method comprising:
receiving a headlamp type;
transmitting a request for an input parameter value responsive to said headlamp type;
receiving said input parameter value in response to said transmitting a request;
executing a transfer function in response to said input parameter and said headlamp type, said executing resulting in a predicted maximum reflector temperature; and
outputting said predicted maximum reflector temperature.

2.

The method of claim 1
further comprising:

selecting	**a type of thermoplastic material**
	that exhibits a heat resistance
	that exceeds said predicted maximum reflector temperature;
and	
outputting	**said type of thermoplastic material**
	in response to said selecting.

請求項1の方法は　　更に（以下でもって）構成する：
前記予測された反射鏡最大温度を超えている

耐熱性を表明している
加熱可塑材の型を　選ぶこと；
及び
前記選択することに対応して
加熱可塑材の前記の型を　出力すること．

The method of claim 1 further comprising:
selecting a type of thermoplastic material that exhibits a heat resistance that exceeds said predicted maximum reflector temperature; and
outputting said type of thermoplastic material in response to said selecting.

3.

The method of claim 1
further comprising
creating **said transfer function,**
said creating said transfer function
including:
receiving **a headlamp application group** including a member;
classifying **said member** based on geometric primitives
resulting in said headlamp type;
identifying **key material and geometric parameters**
that affect said predicted maximum reflector temperature
for said headlamp type;
creating **a simple parametric geometric model**
responsive to said key material and geometric parameters;
setting **a design space**
for said key material and geometric parameters;
creating **a set of design of experiments**
in response to said design space and said model;
carrying out **said set of design of experiments**
resulting in design of experiment output;
and
deriving **said transfer function**
to calculate said predicted maximum reflector temperature
for said headlamp type
responsive to said design of experiment output
wherein
said predicted maximum reflector temperature
varies in response to said input parameter.

請求項1の方法は　更に（以下で）構成する：
前記移転函数を　創生すること、
その前記の移転函数を前記創生することは
（以下を）含む：
構成要員を含むところの
前照灯用途群を　受信すること；
前記前照灯の型という結果となる
外形基本図に基づいての前記材料を　分類すること；
前記前照灯型に対しての
前記予測された反射鏡最大温度に影響を与える
鍵となる材質と外形パラメータを　識別認証すること；
前記鍵となる材質と外形パラメータに対応する

単純なパラメータ的外形モデルを　　　創生すること；
前記鍵となる材質と外形パラメータに対しての
設計空間を　　　　　　　　　　　　　設定すること；
前記設計空間と前記モデルに対応しての
実験設計一式を　　　　　　　　創生すること；
実験出力の設計という結果となる
前記実験設計一式を　　　　　遂行すること；
及び
前記実験出力の設計に対応しての
前記前照灯型に向けて
予測された反射鏡最大温度を計算するための
移転函数を　　　　　　　　　　引き出すこと
そこにおいて
前記予測された反射鏡の最大温度は
前記入力パラメータに対応して　ばらつく．

The method of claim 1 further comprising creating said transfer function, said creating said transfer function including:
receiving a headlamp application group including a member;
classifying said member based on geometric primitives resulting in said headlamp type;
identifying key material and geometric parameters that affect said predicted maximum reflector temperature for said headlamp type;
creating a simple parametric geometric model responsive to said key material and geometric parameters;
setting a design space for said key material and geometric parameters;
creating a set of design of experiments in response to said design space and said model;
carrying out said set of design of experiments resulting in design of experiment output; and
deriving said transfer function to calculate said predicted maximum reflector temperature for said headlamp type responsive to said design of experiment output wherein said predicted maximum reflector temperature varies in response to said input parameter.

4.

The method of claim 3
wherein
said input parameter
includes　　one of said key material and geometric parameters.

請求項3の方法
そこにおいて
前記入力パラメータは
前記鍵となる材質と外形のパラメータの一つを
含む．

The method of claim 3 wherein said input parameter includes one of said key material and geometric parameters.

5.

The method of claim 3
wherein
said headlamp application group
is　　a fog lamp group.

請求項3の方法
そこにおいて
前記前照灯利用群は

霧用ランプ　　　　　である．

The method of claim 3 wherein said headlamp application group is a fog lamp group.

6.

The method of claim 3

wherein

said **headlamp type**

is one of round fog lamp, teardrop fog lamp and square fog lamp.

請求項3の方法

そこにおいて

前記前照灯の型は

円形霧用ランプ、涙形霧用ランプ及び四角形霧用ランプのどれかひとつ

である．

The method of claim 3 wherein said headlamp type is one of round fog lamp, teardrop fog lamp and square fog lamp.

7.

The method of claim 3

wherein

said **geometric primitives**

include arc of circle, parabolic curve and right angle cylinder.

請求項3の方法

そこにおいて

前記外形基本図は

円弧、方物線状曲線、及び直角シリンダを

含む．

The method of claim 3 wherein said geometric primitives include arc of circle, parabolic curve and right angle cylinder.

8.

The method of claim 3

wherein

said **key material and geometric parameters**

include

two or more of reflector diameter, lens depth, spacer depth, reflector depth, bulb diameter, bulb depth and wattage of bulb.

請求項3の方法

そこにおいて

前記鍵となる材質と外形パラメータは

二つあるいはそれ以上の反射鏡直径、レンズ奥行き、スペーサー奥行き、反射鏡奥行き、電球直径、電球奥行き、及び電球のワット数を

含む．

The method of claim 3 wherein said key material and geometric parameters include two or more of reflector diameter, lens depth, spacer depth, reflector depth, bulb diameter, bulb depth and wattage of bulb.

9.

The method of claim 3

wherein

said **design space**

includes

the maximum and minimum values

for said key material and geometric parameters.

請求項3の方法
そこにおいて
前記設計空間は
前記鍵となる材質と外形パラメータに対しての
最大値と最小値を　　　含む.

The method of claim 3 wherein said design space includes the maximum and minimum values for said key material and geometric parameters.

10.

The method of claim 3
wherein
said **creating a set of design of experiments**
is performed
using a statistical analysis tool.

請求項3の方法
そこにおいて
前記の実験設計一式の創生は
統計分析ツールを使うことで
実行される.

The method of claim 3 wherein said creating a set of design of experiments is performed using a statistical analysis tool.

11.

The method of claim 3
wherein
said **carrying out** said **set of design of experiments**
is performed
using heat transfer and flow analysis simulation tools.

請求項3の方法
そこにおいて
前記実験設計一式を前記遂行することは
熱転移とフロー分析シミュレーションツールを使うことで
実行される.

The method of claim 3 wherein said carrying out said set of design of experiments is performed using heat transfer and flow analysis simulation tools.

12.

The method of claim 3
wherein
said **deriving a transfer function**
is performed
using regression analysis software.

請求項3の方法
そこにおいて
前記の移転函数を引き出すことは
回帰分析ソフトウエアを使って
実行される.

The method of claim 3 wherein said deriving a transfer function is performed using regression analysis software.

13.

A method of creating a transfer function

for calculating a predicted maximum headlamp reflector temperature,

said method comprising:

receiving **a headlamp application group** including a member;

classifying **said member** based on geometric primitives resulting in a headlamp type;

identifying **key material and geometric parameters** that affect a predicted maximum reflector temperature for said headlamp type;

creating **a simple parametric geometric model** responsive to said key material and geometric parameters;

setting **a design space** for said key material and geometric parameters;

creating **a set of design of experiments** in response to said design space and said model;

carrying out **said set of design of experiments** resulting in output;

and

deriving **a transfer function** to calculate said predicted maximum reflector temperature for said headlamp type responsive to said output

wherein

said predicted maximum reflector temperature

varies **in response to an input parameter.**

予測された前照灯反射鏡の最大温度を計算するための

移転函数を創生する方法、

前記方法は **(以下で) 構成する:**

＊以下請求項3に同じ

A method of creating a transfer function for calculating a predicted maximum headlamp reflector temperature, said method comprising:

receiving a headlamp application group including a member;

classifying said member based on geometric primitives resulting in a headlamp type;

identifying key material and geometric parameters that affect a predicted maximum reflector temperature for said headlamp type;

creating a simple parametric geometric model responsive to said key material and geometric parameters;

setting a design space for said key material and geometric parameters; creating a set of design of experiments in response to said design space and said model;

carrying out said set of design of experiments resulting in output; and

deriving a transfer function to calculate said predicted maximum reflector temperature for said headlamp type responsive to said output wherein said predicted maximum reflector temperature varies in response to an input parameter.

14.

A system for predicting headlamp reflector temperature,

the system comprising:

a network;

a user system in communication with said network;

a storage device;
and
a host system
in communication with said network and said storage device,
said host system
including
application software to implement a method
comprising:

receiving **a headlamp type**
from said user system via said network;
transmitting **a request** across said network
for an input parameter value
responsive to said headlamp type;
receiving **said input parameter value**
from said user system via said network
in response to said transmitting a request;
executing **a transfer function**
stored on said storage device
in response to said input parameter and said headlamp type,
said executing resulting in a predicted maximum reflector temperature;
and
outputting **said predicted maximum reflector temperature**
to said user system via said network.

前照灯反射鏡の温度を予測するためのシステム、
そのシステムは (以下で) 構成する
ネットワーク;
前記ネットワークと通信している
ユーザーシステム;
蓄積保管装置;
及び
前記ネットワークと前記蓄積保管装置と通信している
ホストシステム、
前記ホストシステムは
方法を組み込み搭載するための
アプリケーションソフトウエアを 含み
(以下で) 構成する:
ネットワークを介して前記ユーザーシステムから
前照灯型を 受信すること;
前記前照灯型に対応する
入力パラメータ値に関する
要請を
前記ネットワーク全体を通して 伝送すること;
前記要請を伝送することに応じて
前記ネットワークを介して
ユーザーシステムから
前記入力パラメータ値を 受信すること;
前記入力パラメータ及び前照灯型に応じて
前記蓄積保管装置に蓄積された

移転函数を　　　　　　　　　　　　　　　実行すること；
その実行は　　予測された反射鏡の最大温度という　　結果となり；
及び
前記ネットワークを介して前記ユーザーシステムへ
前記予測された反射鏡最大温度を　　　出力すること．

A system for predicting headlamp reflector temperature, the system comprising:
a network;
a user system in communication with said network;
a storage device; and
a host system in communication with said network and said storage device, said host system including application software to implement a method comprising:
receiving a headlamp type from said user system via said network;
transmitting a request across said network for an input parameter value responsive to said headlamp type;
receiving said input parameter value from said user system via said network in response to said transmitting a request;
executing a transfer function stored on said storage device in response to said input parameter and said headlamp type, said executing resulting in a predicted maximum reflector temperature; and
outputting said predicted maximum reflector temperature to said user system via said network.

15.

The system of claim 14
wherein
said host system
includes
application software to implement a method
further comprising
creating　**said transfer function,**
said creating said transfer function
including:
receiving　**a headlamp application group**
including a member;
classifying　**said member**
based on geometric primitives
resulting in said headlamp type;
identifying　**key material and geometric parameters**
that affect said predicted maximum reflector temperature
for said headlamp type;
creating　**a simple parametric geometric model**
responsive to said key material and geometric parameters;
setting　**a design space**
for said key material and geometric parameters;
creating　**a set of design of experiments**
in response to said design space and said model;
carrying out　**said set of design of experiments**
resulting in design of experiment output;
and
deriving　**said transfer function**
to calculate said predicted maximum reflector temperature

for said headlamp type
responsive to said design of experiment output

wherein
said predicted maximum reflector temperature
varies in response to said input parameter.

請求項１４のシステム
そこにおいて
前記ホストシステムは
方法を組み込み搭載するアプリケーションソフトウエアを
含み
（そのアプリケーションソフトウエアは） 更に（以下で）構成する
前記移転函数を 創生すること、
その前記移転函数を創生することは （以下を）含む：

＊以下、請求項１３に同じ
＊つまり、「方法」とは、「移転函数を創生すること」であることが、ここで限定されている．

The system of claim 14 wherein said host system includes application software to implement a method further comprising creating said transfer function, said creating said transfer function including:
receiving a headlamp application group including a member;
classifying said member based on geometric primitives resulting in said headlamp type;
identifying key material and geometric parameters that affect said predicted maximum reflector temperature for said headlamp type;
creating a simple parametric geometric model responsive to said key material and geometric parameters;
setting a design space for said key material and geometric parameters;
creating a set of design of experiments in response to said design space and said model;
carrying out said set of design of experiments resulting in design of experiment output; and
deriving said transfer function to calculate said predicted maximum reflector temperature for said headlamp type responsive to said design of experiment output wherein said predicted maximum reflector temperature varies in response to said input parameter.

16.
The system of claim 14
wherein
said user system
is **a hand held device.**

請求項１４のシステム
そこにおいて
前記ユーザーシステムは
携帯装置 である．

The system of claim 14 wherein said user system is a hand held device.

17.
The system of claim 14
wherein
said network
is **a wireless network.**

請求項１４のシステム
そこにおいて
前記ネットワークは
無線ネットワーク である．

The system of claim 14 wherein said network is a wireless network.

18.

The system of claim 14

wherein

said network

is the Internet.

請求項１４のシステム

そこにおいて

前記ネットワークは

インターネット である.

The system of claim 14 wherein said network is the Internet.

19.

The system of claim 14

wherein

said network

is an intranet.

請求項１４のシステム

そこにおいて

前記ネットワークは

イントラネット である.

The system of claim 14 wherein said network is an intranet.

20.

A computer program product

for predicting headlamp reflector temperature,

the computer product comprising:

a storage medium

readable by a processing circuit

and

storing instructions

for execution by the processing circuit

for performing a method

comprising:

receiving a headlamp type;

transmitting a request

for an input parameter value

responsive to said headlamp type;

receiving said input parameter value

in response to said transmitting a request;

executing a transfer function

in response to said input parameter and said headlamp type,

said executing resulting in a maximum reflector temperature;

and

outputting said predicted maximum reflector temperature.

前照灯反射鏡の温度を予測するための

コンピュータプログラム製造物、

このコンピュータ製造物は (以下で)構成する:

処理回路によって読み取り可能な

蓄積保管媒体
及び
方法を遂行するために
処理回路によって実行される
蓄積命令
（その命令は）　　　　（以下で）構成する：
前照灯の型を　　　　　　　　受信すること；
前記前照灯の型に応じての
入力パラメータへの
要請を　　　　　　　　　　　伝送すること；
前記の要請を伝送することに応じての
前記の入力パラメータ値を　　受信すること；
前記の入力パラメータ値と
前記の前照灯の型に対応しての
移転函数を　　　　　　　　　実行すること；
その実行は反射鏡の最大温度という　結果となる；
そして
前記の予測された反射鏡最大温度を
出力すること．

A computer program product for predicting headlamp reflector temperature, the computer product comprising:
a storage medium readable by a processing circuit and storing instructions for execution by the processing circuit for performing a method comprising:
receiving a headlamp type;
transmitting a request for an input parameter value responsive to said headlamp type;
receiving said input parameter value in response to said transmitting a request;
executing a transfer function in response to said input parameter and said headlamp type, said executing resulting in a maximum reflector temperature; and
outputting said predicted maximum reflector temperature.

21.

The computer program product of claim 20
wherein
said storage medium
includes
instructions to implement a method
further comprising
creating **said transfer function,**
said creating said transfer function
including:
receiving **a headlamp application group**
including a member;
classifying **said member**
based on geometric primitives
resulting in said headlamp type;
identifying **key material and geometric parameters**
that affect said predicted maximum reflector temperature
for said headlamp type;
creating **a simple parametric geometric model**
responsive to said key material and geometric

parameters;

setting **a design space**

for said key material and geometric parameters;

creating **a set of design of experiments**

in response to said design space and said model;

carrying out **said set of design of experiments**

resulting in design of experiment output;

and

deriving **said transfer function**

to calculate said predicted maximum reflector temperature

for said headlamp type responsive

to said design of experiment output

wherein

said predicted maximum reflector temperature

varies in response to said input parameter.

請求項２０のコンピュータプログラム製造物

そこにおいて

前記蓄積保管媒体は

方法を組み込み搭載する

命令（群）を **含み**

その命令(群)は **更に（以下で）構成する**

前記の移転函数を **創生すること、**

その前記の移転函数を創生することは

（以下を）含む：

＊以下請求項3に同じ

The computer program product of claim 20 wherein said storage medium includes instructions to implement a method further comprising creating said transfer function, said creating said transfer function including:

receiving a headlamp application group including a member;

classifying said member based on geometric primitives resulting in said headlamp type;

identifying key material and geometric parameters that affect said predicted maximum reflector temperature for said headlamp type;

creating a simple parametric geometric model responsive to said key material and geometric parameters;

setting a design space for said key material and geometric parameters;

creating a set of design of experiments in response to said design space and said model;

carrying out said set of design of experiments resulting in design of experiment output; and

deriving said transfer function to calculate said predicted maximum reflector temperature for said headlamp type responsive to said design of experiment output wherein said predicted maximum reflector temperature varies in response to said input parameter.

US006773149B2

(12) **United States Patent**
Kulkarni et al.

(10) **Patent No.:** **US 6,773,149 B2**
(45) **Date of Patent:** **Aug. 10, 2004**

(54) **METHOD, SYSTEM AND COMPUTER PRODUCT FOR PREDICTING HEADLAMP REFLECTOR TEMPERATURE**

(75) Inventors: **Anant Kulkarni**, Maharashtra (IN); **Eric Jaarda**, Ann Arbor, MI (US); **James Wilson**, Troy, MI (US); **Erwin Liang**, Ballston Lake, NY (US)

(73) Assignee: **General Electric Company**, Pittsfield, MA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 37 days.

(21) Appl. No.: **10/248,083**

(22) Filed: **Dec. 17, 2002**

(65) **Prior Publication Data**

US 2004/0114388 A1 Jun. 17, 2004

(51) **Int. Cl.**[7] **F21V 7/00**
(52) **U.S. Cl.** **362/516**; 362/296; 362/341
(58) **Field of Search** 362/516, 294, 362/547, 341, 296

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,779,167 A	* 10/1988	Nelson	....	362/547
6,007,224 A	* 12/1999	Jiao et al.	....	362/518
6,688,762 B2	* 2/2004	Dinant	....	362/547
2002/0154514 A1	* 10/2002	Yagi et al.	....	362/510
2003/0043586 A1	* 3/2003	Sagal et al.	....	362/341

OTHER PUBLICATIONS

Infrared Transparent Reflector Materials Sherman K.C. Advances in Automotive Plastic Components and Technology. Conference proceedings Editor(s): GE Plastics, Society of Automotive Engineers Detroit, Mi., Feb. 27–Mar. 2, 1995, p. 49–54, 63 Tr.Ro 1995.

William I. Moore and Christopher R. Powers (Guide Corporation) 2000–01–0801 "Utilizing CFD for Thermal Analysis of a Prototype HID Fog lamp" SAE Technical Paper series.

Liang Erwin W (GE CRD), Kena Yokoyama (GE CRD), Wilson Jim Ge Plastic 2000–01 1396 "Three–Dimensional Heat Transfer and Thermo–elastic Deformation Predictions in Forward Lighting" SAE Technical paper series.

Liang, E.W. (Ge Corporate Research and Development); Lillquist, R.D.; Gallo, J.P.; Poslinski, A.J.; Grimson, A. Strauss, B.R. Predicting the thermal performance of an automotive fog lamp reflector. Proceedings of the 1997 International Congress and Exposition, Detroit, MI, USA Feb. 24–27, 1997.

* cited by examiner

Primary Examiner—Y. My Quach-Lee
Assistant Examiner—Peggy A. Neils

(57) **ABSTRACT**

A method for predicting headlamp reflector temperature comprising receiving a headlamp type and transmitting a request for an input parameter value responsive to the headlamp type. The input parameter value is received in response to transmitting the request. A transfer function is executed in response to the input parameter and the headlamp type and the execution results in a predicted maximum reflector temperature. The predicted maximum reflector temperature is then output.

21 Claims, 4 Drawing Sheets

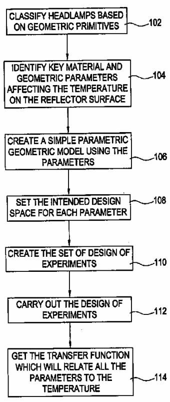


FIG. 1

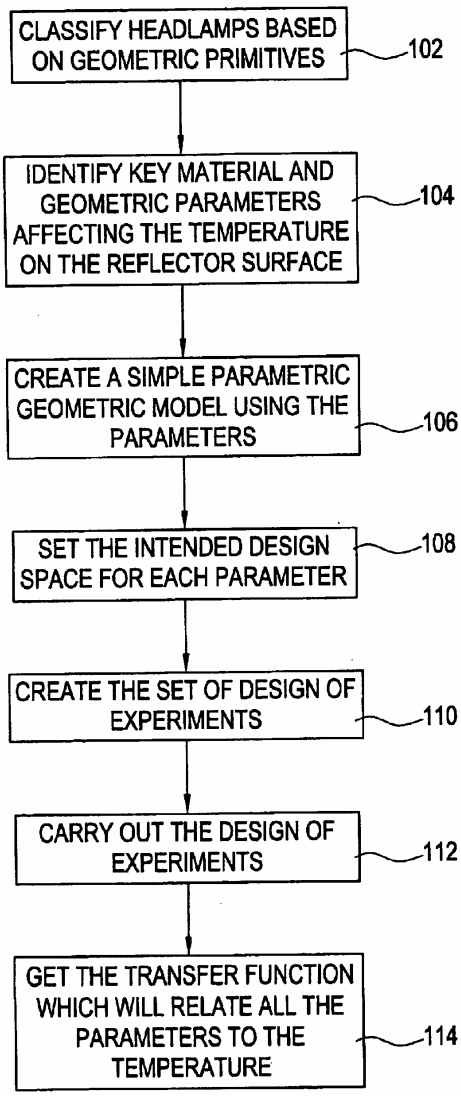

CLASSIFY HEADLAMPS BASED ON GEOMETRIC PRIMITIVES
102
IDENTIFY KEY MATERIAL AND GEOMETRIC PARAMETERS AFFECTING THE TEMPERATURE ON THE REFLECTOR SURFACE
104
CREATE A SIMPLE PARAMETRIC GEOMETRIC MODEL USING THE PARAMETERS
106
SET THE INTENDED DESIGN SPACE FOR EACH PARAMETER
108
CREATE THE SET OF DESIGN OF EXPERIMENTS
110
CARRY OUT THE DESIGN OF EXPERIMENTS
112
GET THE TRANSFER FUNCTION WHICH WILL RELATE ALL THE PARAMETERS TO THE TEMPERATURE
114

FIG. 2

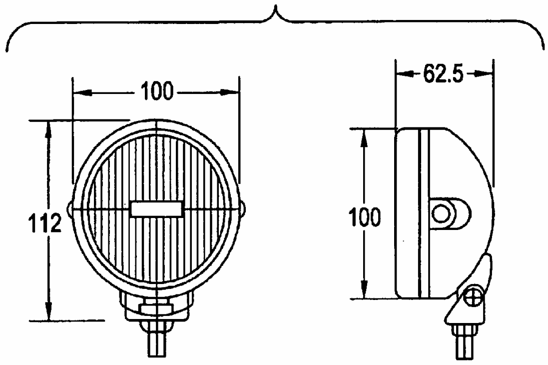

100
112
62.5
100

FIG. 3

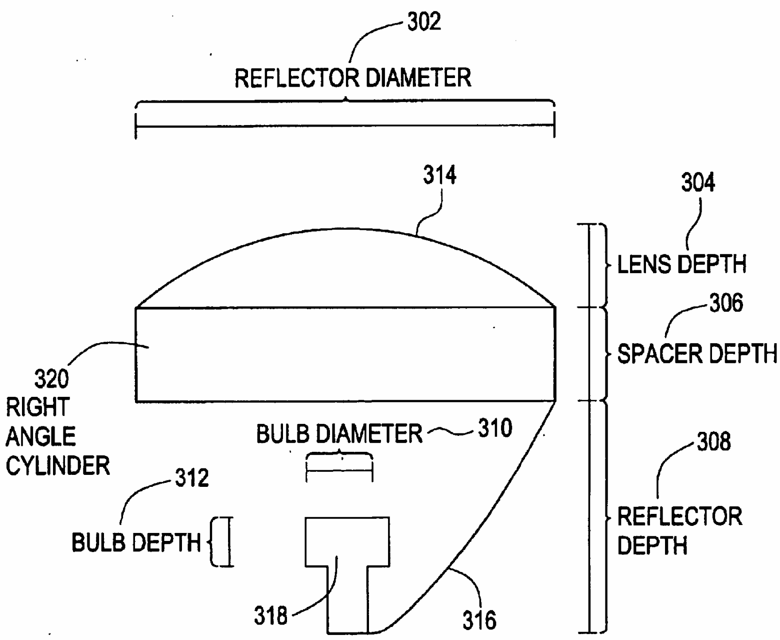

302
REFLECTOR DIAMETER
314
304
LENS DEPTH
306
SPACER DEPTH
320
RIGHT
ANGLE
CYLINDER
BULB DIAMETER
310
308
312
REFLECTOR
DEPTH
BULB DEPTH
318
316

FIG. 4

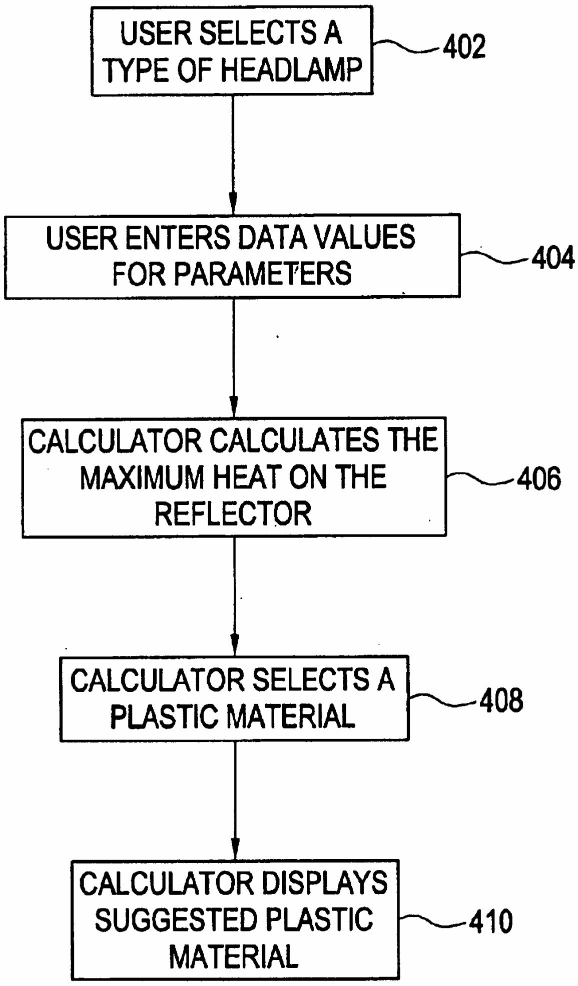
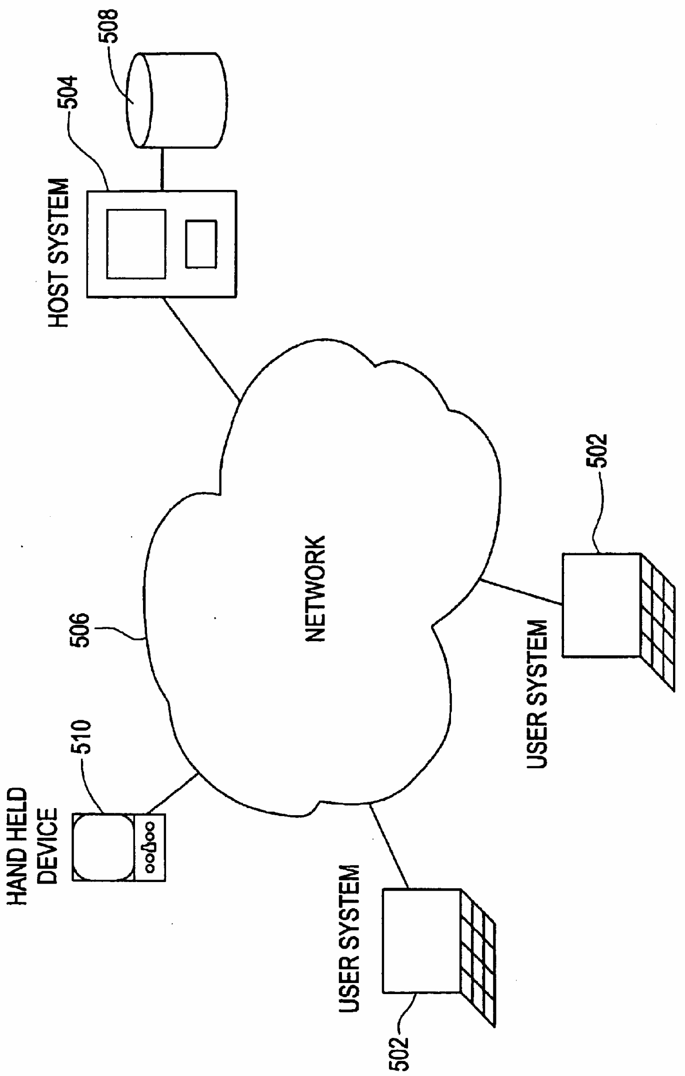

USER SELECTS A TYPE OF HEADLAMP
402
USER ENTERS DATA VALUES FOR PARAMETERS
404
CALCULATOR CALCULATES THE MAXIMUM HEAT ON THE REFLECTOR
406
CALCULATOR SELECTS A PLASTIC MATERIAL
408
CALCULATOR DISPLAYS SUGGESTED PLASTIC MATERIAL
410

FIG. 5


508
504
HOST SYSTEM
NETWORK
506
502
USER SYSTEM
510
HAND HELD
DEVICE
USER SYSTEM
502

METHOD, SYSTEM AND COMPUTER PRODUCT FOR PREDICTING HEADLAMP REFLECTOR TEMPERATURE

BACKGROUND OF INVENTION

The present disclosure relates generally to a method for predicting headlamp reflector temperature and in particular, to a method for predicting the maximum temperature on automotive headlamp reflectors.

A variety of thermoplastic materials are available in the marketplace for use in automotive lighting systems. A basic criterion for material selection in lighting systems is heat resistance and in general, the higher the heat resistance, the higher the cost of the thermoplastic. Heat resistance is the maximum temperature the components can sustain indefinitely without degradation of function. If the component is a headlamp reflector, the maximum temperature of the reflector can be affected by design considerations such as reflector diameter, bulb diameter, bulb depth, lens depth, spacer depth and reflector depth. Predicting the maximum temperature for use in the selection of materials in lighting applications, such as the headlamp reflector material, can involve detailed fluid dynamics and heat transfer analysis for a particular configuration. The process of performing detailed fluid analysis and heat transfer analysis for each configuration in order to determine the maximum temperature on the reflector (hot spot) can be cumbersome and time consuming. Estimating the maximum temperature accurately Is important in order to avoid the expense and time associated with re-creating thermoplastic molding tools and processes.

SUMMARY OF INVENTION

One aspect of the invention is a method for predicting headlamp reflector temperature. The method comprises receiving a headlamp type and transmitting a request for an input parameter value responsive to the headlamp type. The input parameter value is received in response to transmitting the request. A transfer function is executed in response to the input parameter and the headlamp type and the execution results in a predicted maximum reflector temperature. The predicted maximum reflector temperature is then output.

Another aspect of the invention is a method of creating a transfer function for calculating a predicted maximum reflector temperature. The method comprises receiving a headlamp application group including a member. The member is classified based on geometric primitives and the classification results in a headlamp type. Key material and geometric parameters that affect a predicted maximum reflector temperature for the headlamp type are identified. A simple parametric geometric model is created responsive to the key material and geometric parameters. A design space is set for the key material and geometric parameters. The method further comprises creating a set of design of experiments in response to the design space and the model. The set of design of experiments is carried out and results in output. A transfer function is derived to calculate the predicted maximum reflector temperature for the headlamp type responsive to the output. The predicted maximum reflector temperature varies in response to an input parameter.

Another aspect of the invention is a system for predicting headlamp reflector temperature. The system comprises a network, a user system in communication with the network, a storage device and a host system. The host system is in communication with the network and the storage device and

the host system includes application software to implement a method comprising receiving a headlamp type from the user system via the network. The method further comprises transmitting a request across the network for an input parameter value responsive to the headlamp type. The input parameter value is received from the user system via the network in response to transmitting the request. A transfer function stored on the storage device is executed in response to the input parameter and the headlamp type and the execution results in a predicted maximum reflector temperature. The predicted maximum reflector temperature is then output to the user system via the network.

A further aspect of the invention is a computer program product for predicting headlamp reflector temperature. The computer program product comprises a storage medium readable by a processing circuit and storing instructions for execution by the processing circuit for performing a method. The method comprises receiving a headlamp type and transmitting a request for an input parameter value responsive to the headlamp type. The input parameter value is received in response to transmitting the request. A transfer function is executed in response to the input parameter and the headlamp type and the execution results in a predicted maximum reflector temperature. The predicted maximum reflector temperature is then output.

Further aspects of the invention are disclosed herein. The above discussed and other features and advantages of the invention will be appreciated and understood by those skilled in the art from the following detailed description and drawings.

BRIEF DESCRIPTION OF DRAWINGS

Referring to the exemplary drawings wherein like elements are numbered alike in the several FIGURES:

FIG. **1** is a block diagram of an exemplary process to create a calculator for predicting headlamp reflector temperature;

FIG. **2** is an example of the geometry that could be associated with a fog lamp;

FIG. **3** is an example of a simplified parametric model for the fog lamp depicted in FIG. **2**;

FIG. **4** is a block diagram of an exemplary process for utilizing a calculator to predict headlamp reflector temperature; and

FIG. **5** is a block diagram of an exemplary system for predicting headlamp reflector temperature.

DETAILED DESCRIPTION

An embodiment of the present invention includes several complimentary components that can be utilized to rapidly provide a prediction of hot-spot temperatures for headlamps, bypassing the need for many man days of finite element modeling and many hours of computer processing unit time. Various lamps are characterized into general classes according to their basic shape. For example, fog lamps can be characterized into teardrop, round, square and oval. Each class is then parameterized by assigning suitable geometric primitives that both approximate the basic shape and which can be varied more or less independently. An experimental design is created for each class that outlines what range of parameters and bulb wattages should be fully explored to adequately describe each class. Next, the experiments specified in the experimental design are carried out by calculating, via three-dimensional fluid dynamics, the hot-spot temperature of each parameterized design/wattage combination indicated by the design experiment. The results of the experiments are fed back through a statistical experimental analysis, and the significant parameters are culled and the transfer functions that relate the hot-spot temperature to those significant parameters are derived. A user can access the hot-spot calculator through a graphical user interface that is customized to accept the headlamp class and the significant parameters. The class and parameters are fed as inputs to the previously derived transfer functions and the resulting output is a predicted hot-spot temperature, or maximum temperature. The calculator can be deployed in a variety of manners Including: web deployed, personal digital assistant deployed, and personal computer deployed.

FIG. **1** is a block diagram of an exemplary process to create a calculator for predicting headlamp reflector temperature. At step **102**, the headlamps within an application group are classified based on geometric primitives, resulting in headlamp types. For example, in the case of automotive lighting applications, there are several application groups such as fog lamps and motorcycle lamps that can be further broken down and classified based on their geometric primitives into headlamp types (e.g., round, square, oval). A variety of thermoplastic materials are available from resin manufacturers for use in automotive lamps. A key criteria for selecting a particular thermoplastic material from the group of available thermoplastic materials includes the heat resistance required by the automotive lamp and the heat resistance provided by the particular thermoplastic material. The effect of varying geometric and material parameters on the required heat resistance (also referred to as the hot-spot temperature) in automotive lamps can be categorized based on geometric primitives. Geometric primitives dictate the shape of the automotive lamp (e.g., round, teardrop, square).

Next, at step **104**, the key material and geometric parameters affecting the temperature on the reflector surface are identified for a particular class of headlamps within an application group. For example, a lamp in the fog lamp application group with a round classification may include geometric parameters such as reflector diameter, reflector depth and wattage of the bulb. Material parameters may include thermal conductivity of material and emissivity of reflective coating. At step **106**, a simple parametric geometric model is created utilizing the parameters. This simple parametric geometric model covers almost all headlamps in the classification group by varying the key parameters. See FIG. **3**, below, for an example of a parametric model for a round fog lamp. The intended design space, or parameter range, is set at step **108**. At step **110**, a design of experiments (DOE) is created for the parametric geometric model. The DOE includes a number of experiments based on possible combinations of geometric, material and process parameters. The DOE can be created using an automated tool (e.g., Design for Six Sigma from Minitab, Inc., Regression, Response Surface Methodology from Minitab, Inc.). Inputs to the DOE tool include the simple parametric geometric model, the intended design space and the parameters. The output from the DOE tool Includes a set of experiments that will cover the design space and that should be performed in order to determine an associated transfer function that correlates the parameters to the temperature on the reflector surface.

At step **112**, the set of experiments described by the output of the DOE tool is performed. In an exemplary embodiment, the experiments are carried out utilizing heat transfer and flow analysis simulation tools (i.e., computational fluid dynamics) to determine the temperature distribution on the reflector surface. Thermal prediction software (e.g., FLUENT from Fluent, Inc.) is utilized to conduct these experiments in a virtual environment. When all of the experiments have been completed, or simulated, a transfer function is derived at step **114** using the results of the experiments. The resulting transfer function relates input parameters (all or a subset of the key parameters in the simple parametric geometric model) to the temperature on the reflector surface. The transfer function is created using a separate regression analysis tool (e.g., Minitab from Minitab, Inc.). Alternatively, the transfer function is created using the DOE tool. The transfer function relates the response variable (the maximum temperature) to the key parameters considered for the DOE. The derived transfer function is then utilized for calculating the maximum temperature on the reflector surface. Geometric and material parameter values for specific customer applications within the design space are input to the transfer function via the calculator. A different transfer function is derived for each class of headlamp, or for each parametric geometric model created in step **106**. In an exemplary embodiment, the transfer function is stored in a database of transfer functions that are indexed by headlamp classification within an application group. The processing described in FIG. **1** is repeated for each headlamp classification defined in step **102** and for headlamps in the other application groups based on implementation requirements.

FIG. **2** is an example of the geometry that is associated with a fog lamp, one of the application groups for automotive headlamps. The headlamp includes a bulb, a reflector, a lens, a decorative bezel and a housing unit. As shown in FIG. **2**, the fog lamp is four and a half inches high, four inches wide, and two and seven sixteenths inches deep. Additionally, the fog lamp depicted in FIG. **2** is classified as a round fog lamp. FIG. **3** is a simplified parametric model associated with the fog lamp depicted in FIG. **2**. The parameters depicted in FIG. **3** can be utilized to create the hot-spot calculator. In addition, several of the parameters depicted in FIG. **3** may be input to the hot-spot calculator in order to predict a maximum reflector temperature. The basic geometric primitives for this parametric model include: circular arc **314**, parabolic curve **316** (note that the reflector is generally, but not necessarily parabolic, and that other shapes, for example a polyelipsoid can also be employed in an alternate embodiment) and right angle cylinder **320**. The fog lamp application group can be broken down into classes based on these basic geometric primitives and can result in classes such as teardrop shaped, round and square depending on the values of the geometric primitives. Also shown in FIG. **3** are parameters that may affect the temperature of the reflector in a fog lamp including reflector diameter **302**, lens depth **304**, spacer depth **306**, reflector depth **308**, bulb diameter **310**, bulb depth **312**. In addition, the wattage of the bulb **318** will also have an effect on the temperature of the reflector. These are the variables that will be tested through the DOE process and may be reflected in the resulting transfer function depending on the results of the DOE. For other application groups (e.g., high beam lamps) other geometric primitives and parameters may be utilized to describe the application group and the associated classes.

FIG. **4** is a block diagram of an exemplary process for utilizing a calculator to predict headlamp reflector temperature. The process depicted in FIG. **4** includes a user accessing the hot-spot calculator from a user system or from a hand held device. At step **402**, the user selects a type of headlamp which includes selecting an application group (e.g., fog lamps, motorcycle lamps) and within the application group a particular classification (e.g., round, square, teardrop shape). At step **404**, the user enters input parameter data values in response to a prompt from the calculator. Parameter values include values for the key parameters that were determined to have an impact on the reflector temperature during the DOE process. Next, step **406** is performed and the hot-spot calculator calculates the maximum heat on the reflector using the transfer function developed as described in reference to FIG. **1**. Based on the results of the transfer function, the calculator, at step **408**, selects, or recommends, a thermoplastic material with an adequate heat resistance rating. The calculator can be vendor specific and recommend a thermoplastic material that the vendor produces or it could be vendor independent and include thermoplastic materials from several vendors. For example, the result of step **406** may be that the maximum heat on the reflector is one hundred and ninety degrees Celsius. Then, at step **408**, the calculator would suggest a thermoplastic material with a maximum heat capacity that exceeds one hundred and ninety degrees Celsius. At step **410**, the calculator displays the suggested material and results of the transfer function. The user can perform this process, from step **402** through **410**, any number of times and can use this data as input to the design process.

FIG. **5** is a block diagram of an exemplary system for predicting headlamp reflector temperature. The system of FIG. **5** depicts how a user (e.g., a designer, a field engineer, an external customer) can make a request, through a user system **502** (e.g., a personal computer, a host attached terminal) or a hand held device **510** (e.g., a personal digital assistant) to an application program on the host system **504** to access the calculator for predicting headlamp reflector temperature. The users can be physically located in one or more geographic locations and can be directly connected to the host system **504** or coupled to the host system via the network **506**. In an exemplary embodiment, the host system **504** executes programs that provide access to the calculator for predicting headlamp reflector temperature and data relating to the temperature prediction (e.g., transfer functions) are stored on the storage device **508** attached to the host system. Each user system **502** and hand held device **510** may be implemented using a general-purpose computer executing a computer program for carrying out the processes described herein. If the user system **502** or hand held device **510** includes a personal computer, the processing described herein may be shared by a user system **502** or hand held device **510** and the host system **504** by providing an applet to the user system **502**.

The network **506** may be any type of known network including a local area network (LAN), a wide area network (WAN), an intranet, or a global network (e.g., Internet). A user system **502** or hand held device **510** may be coupled to the host system **504** through multiple networks (e.g., intranet and Internet) so that not all user systems **502** and hand held devices **510** are required to be coupled to the host system **504** through the same network. One or more of the user systems **502**, hand held device **510** and host system **504** may be connected to the network **506** in a wireless fashion and the network **506** may be a wireless network.

The host system **504** may be implemented using a server operating in response to a computer program stored in a storage medium accessible by the server. The host system **504** may operate as a network server (often referred to as a web server) to communicate with the user systems **502** and hand held device **510**. The host system **504** handles sending and receiving information to and from user systems **502** and hand held devices **510**, and can perform associated tasks. The host system **504** may also include a firewall to prevent unauthorized access to the host system **504** and enforce any limitations on authorized access.

The host system **504** also operates as an application server. The host system **504** executes one or more application programs to create and implement the calculator for predicting headlamp reflector temperature. In an alternate embodiment, the host system **504** includes application programs to implement the calculator for predicting headlamp reflector temperature and the application programs to create the calculator reside remotely from the host system **504**. Processing may be shared by the user system **502** and/or hand held device **510** and the host system **504**. Alternatively, the user systems **502** and hand held device **510** may include stand-alone software applications for performing all or a portion of the processing described herein. It is understood that separate servers may be used to implement the network server functions and the application server functions.

The storage device **508** may be implemented using a variety of devices for storing electronic information such as a file transfer protocol (FTP) server. It is understood that the storage device **508** may be implemented using memory contained in the host system **504** or it may be a separate physical device. The storage device **508** contains a variety of information relating to predicting headlamp reflector temperature including a database of transfer functions and associated parameters for various classes of headlamps within application groups. The host system **504** may also operate as a database server and coordinate access to application data including data stored on the storage device **508**. The data stored in the storage device **508** can be physically stored as a single database with access restricted based on user characteristics or it can be physically stored in a variety of databases including portions of the database on the user systems **502**, hand held device **510** and host system **504**.

An embodiment of the present invention can be utilized for determining the maximum temperature of a component in a variety of lighting applications and is not limited to automotive lighting nor to reflector components of lamps. Types of lighting applications that may utilize an embodiment of the present invention include, but are not limited to: fog lamps, car head lights, motorcycle lights, projector lamps, industrial lighting and commercial lighting. In addition, an embodiment of the present invention can be expanded to other design spaces and is not limited to lamps. For example, embodiments of the present invention may be utilized: to perform thermal evaluation of electrical enclosures, for structural evaluation of energy absorbing applications, for evaluation of a simplified part manufacturing process, and to perform a quick evaluation of the desired functionality of an application or product with fair accuracy before selecting an application or product from a range available in the market.

The methodology for developing the calculator is based on generating transfer functions that are derived from three-dimensional thermal analysis of generic parametric models representing configurations currently utilized in lighting design. The simulation tools and statistical tools used for the analysis that are utilized to build the hot-spot calculator are commercially available. Design of experiment (DOEs) techniques are utilized in order to derive the transfer functions. The use of the resulting hot-spot calculator can reduce the time required for the material selection process, which in turn can reduce product design cycle time. Design trade-off studies can be carried out for various lighting system shapes and parameters by utilizing the hot-spot calculator.

An embodiment of the present invention provides for a method to estimate the temperature of headlamp reflectors that is completely based on transfer functions. This can result in a quick estimate that can be utilized at the conceptual level of design and can allow a designer to obtain several estimates and use the results in creating the design of the headlamp. An embodiment of the present invention is web enabled and can be utilized by field engineers, or authorized customers, to assist customers in making immediate material selection decisions for specific applications. Also, the ability to estimate the maximum temperature of a headlamp reflector can result in choosing the most economic thermoplastic material that meets the design requirements. This can also result in eliminating costly rework to thermoplastic molding tools or processes.

As described above, the embodiments of the invention may be embodied in the form of computer-implemented processes and apparatuses for practicing those processes. Embodiments of the invention may also be embodied in the form of computer program code containing instructions embodied in tangible media, such as floppy diskettes, CD-ROMs, hard drives, or any other computer-readable storage medium, wherein, when the computer program code is loaded into and executed by a computer, the computer becomes an apparatus for practicing the invention. An embodiment of the invention can also be embodied in the form of computer program code, for example whether stored in a storage medium, loaded into and/or executed by a computer, or transmitted over some transmission medium, such as over electrical wiring or cabling, through fiber optics, or via electromagnetic radiation, wherein, when the computer program code is loaded into and executed by a computer, the computer becomes an apparatus for practicing the invention. When implemented on a general-purpose microprocessor, the computer program code segments configure the microprocessor to create specific logic circuits.

While the invention has been described with reference to exemplary embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the invention. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from the essential scope thereof. Therefore, it is intended that the invention not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this invention, but that the invention will include all embodiments falling within the scope of the appended claims. Moreover, the use of the terms first, second, etc. do not denote any order or importance, but rather the terms first, second, etc. are used to distinguish one element from another.

What is claimed is:

1. A method for predicting headlamp reflector temperature, the method comprising:

receiving a headlamp type;

transmitting a request for an input parameter value responsive to said headlamp type;

receiving said input parameter value in response to said transmitting a request;

executing a transfer function in response to said input parameter and said headlamp type, said executing resulting in a predicted maximum reflector temperature; and

outputting said predicted maximum reflector temperature.

2. The method of claim **1** further comprising:

selecting a type of thermoplastic material that exhibits a heat resistance that exceeds said predicted maximum reflector temperature; and

outputting said type of thermoplastic material in response to said selecting.

3. The method of claim **1** further comprising creating said transfer function, said creating said transfer function including:

receiving a headlamp application group including a member;

classifying said member based on geometric primitives resulting in said headlamp type;

identifying key material and geometric parameters that affect said predicted maximum reflector temperature for said headlamp type;

creating a simple parametric geometric model responsive to said key material and geometric parameters;

setting a design space for said key material and geometric parameters;

creating a set of design of experiments in response to said design space and said model;

carrying out said set of design of experiments resulting in design of experiment output; and

deriving said transfer function to calculate said predicted maximum reflector temperature for said headlamp type responsive to said design of experiment output wherein said predicted maximum reflector temperature varies in response to said input parameter.

4. The method of claim **3** wherein said input parameter includes one of said key material and geometric parameters.

5. The method of claim **3** wherein said headlamp application group is a fog lamp group.

6. The method of claim **3** wherein said headlamp type is one of round fog lamp, teardrop fog lamp and square fog lamp.

7. The method of claim **3** wherein said geometric primitives include arc of circle, parabolic curve and right angle cylinder.

8. The method of claim **3** wherein said key material and geometric parameters include two or more of reflector diameter, lens depth, spacer depth, reflector depth, bulb diameter, bulb depth and wattage of bulb.

9. The method of claim **3** wherein said design space includes the maximum and minimum values for said key material and geometric parameters.

10. The method of claim **3** wherein said creating a set of design of experiments is performed using a statistical analysis tool.

11. The method of claim **3** wherein said carrying out said set of design of experiments is performed using heat transfer and flow analysis simulation tools.

12. The method of claim **3** wherein said deriving a transfer function is performed using regression analysis software.

13. A method of creating a transfer function for calculating a predicted maximum headlamp reflector temperature, said method comprising:

receiving a headlamp application group including a member;

classifying said member based on geometric primitives resulting in a headlamp type;

identifying key material and geometric parameters that affect a predicted maximum reflector temperature for said headlamp type;

creating a simple parametric geometric model responsive to said key material and geometric parameters;

setting a design space for said key material and geometric parameters; creating a set of design of experiments in response to said design space and said model;

carrying out said set of design of experiments resulting in output; and deriving a transfer function to calculate said predicted maximum reflector temperature for said headlamp type responsive to said output wherein said predicted maximum reflector temperature varies in response to an input parameter.

14. A system for predicting headlamp reflector temperature, the system comprising:

a network;

a user system in communication with said network;

a storage device; and

a host system in communication with said network and said storage device, said host system including application software to implement a method comprising:

receiving a headlamp type from said user system via said network;

transmitting a request across said network for an input parameter value responsive to said headlamp type;

receiving said input parameter value from said user system via said network in response to said transmitting a request;

executing a transfer function stored on said storage device in response to said input parameter and said headlamp type, said executing resulting in a predicted maximum reflector temperature; and

outputting said predicted maximum reflector temperature to said user system via said network.

15. The system of claim **14** wherein said host system includes application software to implement a method further comprising creating said transfer function, said creating said transfer function including:

receiving a headlamp application group including a member;

classifying said member based on geometric primitives resulting in said headlamp type;

identifying key material and geometric parameters that affect said predicted maximum reflector temperature for said headlamp type;

creating a simple parametric geometric model responsive to said key material and geometric parameters;

setting a design space for said key material and geometric parameters;

creating a set of design of experiments in response to said design space and said model;

carrying out said set of design of experiments resulting in design of experiment output; and

deriving said transfer function to calculate said predicted maximum reflector temperature for said headlamp type responsive to said design of experiment output wherein said predicted maximum reflector temperature varies in response to said input parameter.

16. The system of claim **14** wherein said user system is a hand held device.

17. The system of claim **14** wherein said network is a wireless network.

18. The system of claim **14** wherein said network is the Internet.

19. The system of claim **14** wherein said network is an intranet.

20. A computer program product for predicting headlamp reflector temperature, the computer product comprising:

a storage medium readable by a processing circuit and storing instructions for execution by the processing circuit for performing a method comprising:

receiving a headlamp type;

transmitting a request for an input parameter value responsive to said headlamp type;

receiving said input parameter value in response to said transmitting a request;

executing a transfer function in response to said input parameter and said headlamp type, said executing resulting in a maximum reflector temperature; and

outputting said predicted maximum reflector temperature.

21. The computer program product of claim **20** wherein said storage medium includes instructions to implement a method further comprising creating said transfer function, said creating said transfer function including:

receiving a headlamp application group including a member;

classifying said member based on geometric primitives resulting in said headlamp type;

identifying key material and geometric parameters that affect said predicted maximum reflector temperature for said headlamp type;

creating a simple parametric geometric model responsive to said key material and geometric parameters;

setting a design space for said key material and geometric parameters;

creating a set of design of experiments in response to said design space and said model;

carrying out said set of design of experiments resulting in design of experiment output; and

deriving said transfer function to calculate said predicted maximum reflector temperature for said headlamp type responsive to said design of experiment output wherein said predicted maximum reflector temperature varies in response to said input parameter.

* * * * *

米国特許公報から論理的学術文体を学びとる

ＵＳＰ 6337149

2005 年 7 月発行

著作 ： 篠原 泰正

発行者： 矢間 伸次

発行所： 日本アイアール株式会社

160-0007 東京都新宿区荒木町 5-4

TEL 03-3357-3467 FAX 03-3357-8277

E-mail：ir@nihon-ir.co.jp