(54) Title: A SYSTEM AND METHOD FOR GENERATING DESIGN ALTERNATIVES
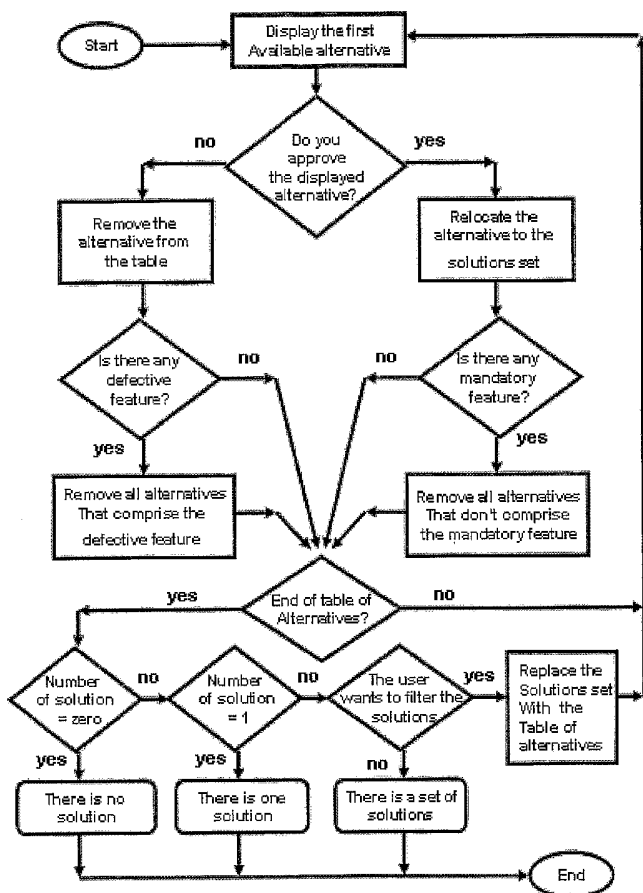
(57) Abstract: This invented machine helps human to reach optimal solutions for any intellectual creation such as building designs, musical compositions, logical planning's, and experimental researches. Usually, the user talks to the machine, pointing out the requirements or goals that he/she needs to achieve in his/her creational work, and immediately, the machine reaches the optimal solution achieving all the user's goals. The optimal solution or creation is presented in a visualized or audio manner according to the nature of creational work. However, this creative machine can be produced to function as separate equipment, as well as it may supplement some other appliances as computers, T.V. sets, cell phones, or robots.

A SYSTEM AND METHOD FOR GENERATING DESIGN ALTERNATIVES

Technical Field

This invention falls under electronic devices category. It is produced to function
5 as a separate equipment, as well as it may supplement some other appliances as
computers, T.V. sets, cell phones, or robots.

Background Art

In fact, many machines help human to achieve different tasks. However; many of
those are unable to help in the process of new creations that necessitate a high level
10 of innovative thinking. As to the contribution of this invention in achieving such
tasks, it supplies the user with a helpful and effective tool to reach optimum creations
that are hard to be accomplished without it. That includes all types of human
intellectual creations, particularly, the following four common categories:

1) Visual Creations. They comprise all types of creations perceived by sight such
15 as a building design, designing shapes for different machines, furniture design,
sculptural artwork, and couture.

2) Audio Creations. They include all types of creations perceived by hearing such
as musical compositions, lyrical and opera melodies.

3) Logical Creations. They incorporate all types of creations that are perceived by
20 mind such as a chess plan to win a game or a planned stratagem to solve a particular
problem.

4) Experimental Creations. They encompass all types of creations that are proved
by testing such as chemical compounds or medication composites.

Thus, the Creative Machines help the user in most major fields of creativeness.

25 **Disclosure of Invention**

The first step in the Creative Machine process is to analyze the human creation to
its constituting elements. Following are some examples analyzing the most common
intellectual creations:

1) All Visual Creations are analyzed to a group of parts. For example, the
30 building plan is analyzed to a group of spaces.

2) All Audio Creations are analyzed to a collection of sounds. For instance, the
musical composition is analyzed to a collection of tunes.

3) All Logical Creations are analyzed to a number of steps. For Example, the
chess plan is analyzed to a number of successive moves.

35 4) All Experimental Creations are analyzed to a set of components. For example,
the medication composite is analyzed to a set of ingredients.

The second step of the Creative Machines process is to form a table comprising
all possible alternatives of a certain creation. Such a table is attained by combining
all the creation elements with each other, in all probable ways, to fit in a single table.
40 Following are examples of such tables.

Example (1); the state of a visual creation is designing a three stones ring,
wherein the available stones colors are blue, red, and green. Hence, in order to select
the most attractive design, the three stones are alternatively placed next to each other
within all different combinations. Thereupon, the Creative Machine will form out a
45 table of alternatives comprising twenty seven possible designs as shown in Fig.1.
This simple table designates blue, red, and green colors by the characters B, R, and
G. In addition, the alternatives of stones colors are arranged in three vertical
columns, while the horizontal rows represent the different alternatives of the design.
For example, the first alternative shows three blue stones, while the sixth presents

green, red, and blue stones respectively, and so on for all other alternatives of the table. Accordingly, any design of the intended ring will be one of the twenty seven alternatives produced by the table. However, tables of design alternatives are usually much larger than this simple one. For instance, the design of a twenty beads

5   necklace, wherein each bead may be represented by one of four possible colors, makes the Creative Machine form a table of alternatives comprising more than one billion different designs.

Example (2); the state of an audio creation is a composition to sing the seven syllables (do, re, me, fa, so, la, te) by two different singers, each with a distinct duration

10   of vocal prolongation, without any interval separating the seven syllables, and provided that the two singers are to start and end at the same time in a way that would produce a melodic creation. In this instance, the duration of vocal prolongation can be defined as the period needed to fold one's finger. Thereby, if each of the seven syllables are considered to take more than one and less than eight durations of vocal prolongation, this

15   process will produce a table of alternatives consisting of fourteen columns, seven for each singer, wherein each column will comprehend the alternatives of vocal prolongation of each of the seven syllables. The demonstrated table in Fig.2 represents just a part of the complete table of possible melodies of this creation. In fact, the display of such an enormously extended table is needless to illustrate the above clarified process.

20   Example (3); the state of a logical creation is a chess game, wherein the intended game would be played on a special chessboard containing two boards as shown in Fig.3. On each board, there are four knights, three of which are white and the fourth is black. The white knights are required to checkmate the black one on both boards in four moves in total, provided that the white knight moves firstly, with no need of consecutive moves

25   on the two boards. In this instance of creation, the two characters M and N designate the black knights, while O, P, Q, R, S and T represent the white knights. Also, the different squares of the chessboard are coded with English characters and digits. Accordingly, Fig.4 illustrates a part of the complete table of alternatives of this creation. However, in spite of the display of all possible correct moves of the knights by the totality of

30   alternatives, some of them only are to achieve the requested requirement.

Example (4); the state of an experimental creation is like producing a chemical compound that is consisting of four different substances A, B, C, and D, each of which equals from one to seven parts out of ten of the total compound weight. Accordingly, Fig.5 illustrates a part of the table of alternatives of this creation.

35   Based on the formation of various tables of alternatives for different intellectual creations; it is noticed that any intellectual creation may be one instance of three possible dimensions. The first one is a one-dimensional creation wherein the elements compositions are interlaced neither in time nor in place. The second example is a two-dimensional creation wherein the elements compositions may interlace in time or place.

40   The third one is a three-dimensional creation wherein the elements compositions may interlace in time or place, and, at the same time, these elements would represent other compositions for other elements interlaced in time or place. The following examples clearly demonstrate the previous definitions.

Example of visual creations dimensions: As an instance of designing a building plan,

45   if some rooms are connected to each other in one direction as shown in Fig.6, the design of the building plan is considered a one-dimensional creation. Another probability would be the one of grouping the various rooms in horizontal and vertical directions as shown in Fig.7, wherein the design is considered a two-dimensional creation. While, in the instance of a multi-story building, each floor is designed separately, taking into account

that all floors would be located on top of each other to form the entire building, and these floors would share common spaces in specific locations such as the elevator or the stairs, as shown in Fig.8. In such a case, the design is considered a three-dimensional creation.

Example of audio creations dimensions: In case of composing a musical recital, if a number of tunes produced by one or more instruments and not interlacing in time as shown in Fig.9, such musical composition is considered a one-dimensional creation. On the contrary, in case of producing interlacing tunes in time as shown in Fig.10, this composition is considered a two-dimensional creation. The three-dimensional creation would be illustrated by one musical composition formed out of several recitals that could be played independently, and together they interlace in time to form the original musical composition, as shown in Fig.11.

Example for logical creations dimensions: In the state of planning a chess game wherein only one pawn moves on the chessboard as shown in Fig.12, such planning is considered a one-dimensional creation. On the other hand, if a number of pawns move on the chessboard, taking into account the relative positions and possible moves of all pawns as shown in Fig.13, then the planning is considered a two-dimensional creation. The three-dimensional creation is presented when the player divides the chessboard to a number of zones each of which is occupied by a group of pawns and is subject to a particular stratagem. At the same time, all zones, with each group of different pawns, cooperate all together to achieve one final goal, as shown in Fig.14.

Example for experimental creations dimensions: In case of experimenting a chemical compound, if the chemical substances are added successively, one after the other, according to the reaction of the earlier one, as shown in Fig.15, such an experiment is considered a one-dimensional creation. On the contrary, if the chemical substances are added to each other at the same time to obtain a certain reaction as shown in Fig.16, then the experiment is considered a two-dimensional creation. The three-dimensional creation is considered when a number of experiments are made in order to obtain certain compounds to be mixed together by way of forming the final compound as shown in Fig.17.

Accordingly, the table of alternatives of Fig.1 falls under the one-dimensional creation, while the table of alternatives of Fig. 2 is classified as a two-dimensional creation. Also the table of alternatives of Fig. 3 is an instance of a three-dimensional creation, and the table of alternatives of Fig. 4 could be considered as one or two or three-dimensional creation upon the way of adding the chemical substances to each others. Worth mentioning, such categorization is significant while forming and dealing with the various tables of alternatives.

The third step in the Creative Machine process is to achieve the user's goal through the following procedure:

a) The Creative Machine displays the different alternatives of creation, one by one, according to the table of alternatives, starting by the first one to be evaluated by the user. In total, there are four probabilities of the user's reaction to any displayed alternative as follows:

* First probability; the user rejects the displayed alternative with pointing out one or more defective features in the alternative, deeming necessary to exclude all other alternatives that have the same defective feature or features.

* Second probability; the user rejects the displayed alternatives without pointing out any defective feature.

* Third probability; the user approves the displayed alternative with pointing out one or more mandatory features in the alternative, deeming necessary to exclude all other

alternatives that do not comprise the same mandatory feature or features.

    * Fourth probability, the user approves the displayed alternative without pointing out any mandatory feature.

    b- On the grounds of the four previous probabilities, the Creative Machine takes up one of the four following reactions:

    * First reaction, as a reaction to the first probability, the Creative Machine removes from the table the displayed alternative as well as all other ones comprising the same defective feature or features pointed out by the user.

    * Second Reaction, as a reaction to the second probability, the Creative Machine removes only the displayed alternative from the table.

    * Third Reaction, as a reaction to the third probability, the Creative Machine relocates the approved alternative from the table to the solutions set. Then, it removes all other alternatives existing in the table that do not comprise the mandatory feature or features previously pointed out by the user.

    * Fourth reaction, as a reaction to the fourth probability, the Creative Machine relocates the approved alternative from the table to the solutions set.

    Following to each of the previously stated reactions, the Creative Machine displays the next available alternative in the table to be evaluated by the user according to one of the four probabilities demonstrated in step (a). Then, the Creative Machine makes up its reaction as demonstrated in step (b).

    c- By repeating the two previous steps (a) and (b), and supposing that the user points out defective or/and mandatory features in the alternatives, the Creative Machine will reach one of the three following outcomes:

    * First outcome, all alternatives are rejected. Consequently, the user remains assured that the intended creative work made of the determined creational elements will not achieve the pointed out requirements or features. In other words, there is no solution in such a case. In fact, this outcome is very valuable for the user since it spares him/her carrying out failing trials through any other process or means than the Creative Machine, without even knowing whether there would be some solution or none at all.

    * Second outcome, the set of alternatives comprehends only one solution that achieves all the requirements or features stated by the user.

    * Third outcome, the Creative Machine reaches a set of solutions achieving all pointed out requirements or features. In such a case, the user will adopt one of the following two courses:

    * First course, the user considers any solution from the solution set, since all alternatives in that set achieve the user's requirements or goals. Thereby, at this point, the Creative Machine concludes the creational process of that project.

    * Second course, the user tries to select the optimal solution from the solution set by pointing out supplementary requirements or features. Accordingly, the Creative Machine replaces the solutions set with the table of alternatives, and then repeats steps (a), (b), and (c) until the user reaches the second outcome of step (c). Thereupon, the Creative Machine concludes the creational process of that project.

    According to the previously described process, Fig.18 illustrates the flow chart of Creative Machine's process. It shows the four different probabilities of the user's action as well as the Creative Machine's reaction for each action; it also reveals the three various outcomes of the creational process.

    The four parts of the Creative Machine: There are four main parts of the Creative Machine that enable the user to reach the optimal creation according to the previous explained process. These four parts are as follows:

1. The Simulation Unit. The Table of Alternatives contains the alternatives of a creation in a symbolic way, where each element is indicated by a character or digit. In fact, it is hard for the user to assimilate the alternatives of that creation through such symbols. However; the Simulation Unit transforms these symbols into what they designate, as parts of visual creations, sounds of audio creations, steps of logical creations, or components of experimental creations. Generally speaking, that is achieved by the visualization and audio tools. For example, in the instance of a visual design, as designing a sculpture, the visualization tool will display the sculpture artwork in 3rd dimension. While in case of an audio creation, as composing a recital the audio tool will produce a musical tunes that simulate the composition of the recital. Also in case of a logical creation, as in case of geometric problem, the steps of the solution will be displayed in a visual manner by the visualization tool. Finally, in case of an experimental creation, as in creating a new material; the visual tool will display a table expressing the weight ratio for the different components of the material. However, all different types of intellectual creation could be expressed in visual or audio manner.

Based on the previous explanation, the Simulation Unit consists of a visualization tool and/or sound tool, according to the usage and nature of the creation. The visualization tool can be produced by the color liquid crystal display (LCD) or any other technology, while the audio tool can be produced by any means giving the same quality and nature of the created sounds. It is also possible to use the computer's screen or cell phone or any other device to act as a visualization tool. Equally the sound system of such devices can be used to act as a sound tool for the Creative Machine. In such cases the Creative Machine functions in connection with the used device as mentioned.

2. The Conversational Unit. The Simulation Unit presents the creation's alternatives, one by one, while the user evaluates each of them by pointing out the defective features of the rejected alternative or the mandatory features of the approved alternatives. However, the Conversational Unit enables the user to express what he/she wants to obtain through a number of spoken sentences. In fact, the customary user's language is usually the one referred to, by way of facilitating the dealing with the Creative Machine.

It is also observed that each type of creation comprises its particular terminology. For example, the vocabulary used in the state of architectural designs differs from the expressions utilized in musical compositions. Equally, the vocabulary used while projecting to solve a rational problem is distinct from the terms describing the process of a chemical experimentation. In spite of these differences in the vocabulary used in each of the various types of creations, yet there are a considerable number of common terms and phrases utilized in most cases of the intellectual creations while using the Creative Machine. Following are some examples of common phrases or commands:

1- "*Start displaying the alternatives*" This command is used when the user requires the Creative Machine to start presenting the different alternatives.

2- "*Reject this alternative because...*" This command is used when the user rejects some alternative for a specific reason. Consequently, the Creative Machine removes all other alternatives comprising the same defective feature.

3- "*Accept this alternative because...*" This command is used when the user requires the presence of a particular feature in all accepted alternatives.

4- "*This alternative is approved*" This command is used upon the user's approval for a certain alternative, and requires the Creative Machine to relocate it in the solutions set, prior to the last refinement of the accepted creations.

On the grounds of the previous clarification and provided that all used phrases are pre-defined to the Creative Machine before the user initiates the creative process; The

Conversational Unit, supplied with a voice recognition system, recognizes the various user's phrases and transforms them to the Interpretation Unit. Though it is possible to use a keyboard instead of the voice recognition system, yet it is much easier for the user to use a spoken language instead of typing a text using any means.

5   3. The Interpretation Unit. This Interpretation Unit transforms the user's commands from the Conversational Unit to the Table of Alternatives. In fact, it converts the user's language to another easily comprehended format for the Creative Machine to deal with. In addition to the process of transforming the user's language, the Interpretation Unit distributes the user's commands to the appropriate column in the table of alternatives.

10 These commands appear as requirements influencing the generation of the alternatives pertaining to each column in the Table of alternatives. For example, in Fig.1 concerning the design of a three stones ring, the first alternative in the table proposes a design formed out of three blue stones. In case the user rejects this alternative and points out that the three stones can't have the same color, the Interpretation Unit will interpret the

15 user's command to the form shown in Fig.19 and distributes it to column number 3. Also, in Fig.2 regarding the collective signing, in order to maintain the same start and end for each of the two persons, as it is requested in the primary condition of that creation, the Interpretation Unit will interpret this condition as shown in Fig.20, and distributes it under the columns assigned for the second singer.

20   4. The Generating Units. These units generate the alternatives of any creation instead of listing them in the table of alternatives. In fact, each unit is assigned for one column of that table. For instance, upon observing closely the columns pertaining to the table demonstrated in Fig.1; the design of the three stones ring, it is noticed that each of them comprises the three alternatives of the stones colors, red, green, and blue, which are

25 referred to by "elements". Also, each element is mentioned once in the first column, three times in the second one, and nine times in the third one respectively. The rate of frequency in each column is called "steps". It is also observed that the first column could be divided into nine identical sections, the second into three, while the third shows a single section; that is designated by the term "loops".

30   Thereupon, this table could be replaced by a number of Generating Units expressing the columns of the table of alternatives by the indication "elements-steps loops" as it is illustrated in Fig.21. Consequently, the table of alternatives demonstrated in Fig.2 could be replaced by a number of Generating Units equal to the number of columns in the table, as shown in Fig.22. In general, through the generating units, it becomes possible to

35 deduce the columns alternatives in the table, and hence, the creational alternatives, with no need to undergo such a long quotation of alternatives that are of a huge number in the majority of creations. However, Fig.23 illustrates the flow chart of generation working on the creation's alternatives during the functioning of Generating Units. Instead Fig.24 shows the creational process of using the four parts of the Creative Machine in addition

40 to the user input in the process. However; this illustration is the base for the electronic design of the Creative Machine

Generally speaking, every different creation is distinct by its unique elements and user's language. Worth mentioning, that the creation's elements as well as the user's language are already set up prior to the formation of the creative device. Accordingly,

45 each type of creation is expected to have a separate Creative Machine, although it is possible to include many different creations in one machine. However; the following three projects give valuable examples of the real work carried out by the Creative Machine.

First Project, in this project the Creative Machine is used to solve the famous riddle

presented by Albert Einstein. Worth mentioning that this riddle is of a single solution and that all its requirements or conditions are determined in advance as it is clear from the riddle's wording. A brief analysis about the functioning method of the Creative Machine is displayed through this example.

5   The riddle's wording; a) In a street there are five houses, painted five different colors. b) In each house lives a person of different nationality. c) These five homeowners each drinks a different kind of beverage, smokes different brand of cigar and keeps a different pet. Considering the following hints: 1) The Brit lives in a red house. 2) The Swede keeps dogs as pets. 3) The Dane drinks tea. 4) The Green house is on the left of the
10   White house. 5) The owner of the Green house drinks coffee. 6) The person who smokes Pall Mall rears birds. 7) The owner of the Yellow house smokes Dunhill. 8) The man living in the centre house drinks milk. 9) The Norwegian lives in the first house. 10) The man who smokes Blends lives next to the one who keeps cats. 11) The man who keeps horses lives next to the man who smokes Dunhill. 12) The man who smokes Blue Master
15   drinks beer. 13) The German smokes Prince. 14) The Norwegian lives next to the blue house. 15) The man who smokes Blends has a neighbor who drinks water. The question is: "Who owns the fish?"
      Following is the functioning method of each of the four parts of the Creative Machine to solve this riddle.
20   1. The Simulation Unit, in such case, utilizes the visualization tool to display the creational alternatives as shown in Fig.25.
      2. The Conversational Unit utilizes the same language employed in the determinatives of the riddle constrains.
      3. The Generating Units, in accordance with the riddle's description, forms out
25   twenty five columns, each five of which are assigned for one house, describing the five features of each house as "pet", "cigar", "beverage", "nationality", and "color". Each of these features is designated by the first two characters of the features name as illustrated in figure #26.
      4. The Interpretation Unit transforms the linguistic sentences stated in this riddle's
30   requirements; then it distributes them to the appropriate Generating Units or columns. As an example of that, the requirement # 1 is transformed into these two formulas as shown in Fig.27 and Fig.28. The first formula is distributed under the Generating Units of columns # 2, #7, #12, #19 and #24. The second formula is distributed under the generating units of columns # 1, #6, #11, #16, and #21. Likewise, the requirement # 8 is
35   transformed into a single formula as shown in Fig.29 and distributed under the generating unit of column # 13. The same is applicable on the other requirements, taking in consideration the differences among the formulas of various requirements as well as the distributed placements under their appropriate Generating Units.
      Since all requirements are declared in advance and entered all together at the same
40   time into the Creative Machine; so the riddle's solution is attained in a single step as shown in Fig.30. Therefore, the term "German" is the response to the raised question in that riddle, whereas the person of German nationality is the one keeping "fish" in his/her house.
      Second Project; this project is distinct from the previous one as to the number of
45   solutions and steps leading to them. Following is the project's wording:
      "In some plane desert area, it is required to spread the ten shown different military units in Fig.31, wherein each unit is shaped in an identical square, and is connected to another unit at least, through the sharing of one complete side of the square. Wroth mentioning that the user of the Creative Machine in this project is a military expert."

Following is the functioning method of each of the four parts of the Creative
Machine to reach the suitable planning for this project.

1. The Simulation Unit, in such a case, utilizes the visualization tool to display the
creational alternatives proposing the spread of the ten military units.

5   2. The Conversational Unit utilizes the linguistic sentences shown in Fig.32 to be
used in this project.

3. The Generating Units. As shown in Fig.33, based on the necessity of connecting
each military unit to another unit, it is assumed that if the first unit is placed in a
suppositional location, as the designated square by character (A) in the displayed figure,

10   its connecting squares may be one the designated squares by the character (B). Likewise,
the third square, being subject to a possible connection with the first or the second ones,
could be one of the figure's squares that are designated by letter (B) or (C). The same
goes for the remaining squares. Thereupon, the number of squares that could be filled
with military units reaches 181, as identified by different colors. Accordingly, the

15   Generating Units are made of 181 columns divided into 10 sets each of which comprises
a number of successive sub-columns as follows: 1, 4, 8, 12, 16, 20, 24, 28, 32 and 36.
Fig.34 demonstrates the distribution of various columns pertaining to the ten sets.

4. The Interpretation Unit. Fig.35 shows a sample of the user's commands, while
Fig.36 illustrates the transferred formula of this command, wherein the interpretation

20   unit distributes the formula to all table's sets.

Fig.37, 38, 39, 40, 41, 42, and 43 illustrate the displayed alternatives and the
different requirements pointed out by the user. At the end, the final solution achieving all
goals and constrains of the user is displayed.

Third Project, this project is distinct from the two previous ones in many details. It

25   targets some aesthetic purposes as shown in the following description:

"A plastic arts craftsman wishes to design a three- dimensional vase formed out of
nine circular levels with radii varying between one to ten longitudinal units. Likewise;
the height of each level or circle varies from zero to ten longitudinal units."

Following is the functioning method of each of the four parts of the Creative

30   Machine to reach the best design for this vase.

1. The Simulation Unit will utilize the visualization tool to display the creational
alternatives of the different design of the vase.

2. The Conversational Unit. This project's expressing language is marked by its
simplicity since it does not go beyond common linguistic sentences, in addition to some

35   plain mathematical equations.

3. The Generating Units. They will form a number of columns equal to the number of
designing elements (9 levels). Each basic column is divided into two sub-columns, one
of which is assigned for the height alternatives (from zero to 9); while the other shows
the possible radii of various levels circles (from 1 to 10). Thereby, the columns

40   pertaining to the creation are shown in Fig.44.

4. The Interpretation Unit. Fig.45 illustrates one user's command, while Fig.46
illustrates the transformed formula of the same command which is distributed under the
generating unit of column # 17. Another sample of the user's command is shown in the
Fig.47, while Fig.48 shows the transformed formula of the same command. In this case,

45   the formula will be distributed to columns # 6 and # 12.

As to this visual design of aesthetic purposes, the process steps are expected to be
more numerous than the first two projects. Therefore, some sets of alternatives are
browsed while stating the general requirements utilized by the designer for each set.
Fig.49 displays some alternatives attained by the utilization of some designing

requirements related to the radii of different circles or levels, while Fig.50 shows other groups of alternatives attained by achieving some other requirements related to the height of circle's levels. At the end, Fig.51 displays some final alternatives that achieve the designer's commands or goals.

5   Fig.52, Fig.53, and Fig.54 illustrate some suggested designs for the shape of a Creative Machine to contain the four main parts of the invention. However; many different shape designs could be used for this invention to accommodate the different preferences for different users.

Brief Description of the Drawings;

10   Fig.1 illustrates the table of alternative while designing a ring with three stones, wherein the available stones colors are blue (B), red (R), and green (G).

Fig.2 illustrates a part of the table of alternatives of a singing composition performed by two persons.

Fig.3 illustrates a special chessboard containing two boards to play one game on each

15   of them.

Fig.4 illustrates a part of the table of alternatives of a special chess game composing of eight knights only.

Fig.5 illustrates part of table of alternatives of a chemical compound consisting of four different substances A, B, C, and D.

20   Fig.6 illustrates a design of a building plan consisting of a group of connected rooms in one direction.

Fig.7 illustrates a design of a building plan consisting of a group of connected rooms in horizontal and vertical directions.

Fig.8 illustrates a design of a building plan consisting of a number of floors located

25   on top of each other.

Fig.9 illustrates a number of musical tunes not interlacing in time with each other.

Fig.10 illustrates a number of musical tunes interlacing in time with each other.

Fig.11 illustrates a number of musical recitals interlacing in time with each other and each recital is composed of a number of musical tunes interlacing in time with each

30   other.

Fig.12 illustrates a chessboard with one pawn, as an example of a logical creation in one dimension.

Fig.13 illustrates a chessboard with a number of pawns, as example of a logical creation in two dimensions.

35   Fig.14 illustrates a chessboard with a number of pawns, as example of a logical creation in three dimensions.

Fig.15 illustrates adding different doses of chemical substances successively to create a chemical compound.

Fig.16 illustrates adding different doses of chemical substances together at the same

40   time to create a chemical compound.

Fig.17 illustrates a number of different chemical creations for compounds, then mixing all the created compounds together to obtain a final compound.

Fig.18 illustrates the flow chart of the Creative Machine process, and the user's rule in the process

45   Fig.19 illustrates the displayed alternative, the visual simulation of the alternative, the user's command, and the interpreted formula of the user's command.

Fig.20 illustrates the interpreted formula to achieve the same start and end for two singers.

Fig.21 illustrates the three generating units of the table of alternatives of design the

ring of the three stones

Fig.22 illustrates the generating units of the table of alternatives for the singing composition for the two singers

Fig.23 illustrates the flow chart of the generating units to generate the different
5   alternatives of the creation.

Fig.24 illustrates the creational process of using the four parts of the Creative Machine in addition to the user's input in the process.

Fig.25 illustrates the display of the visualization tool for the first project (Albert Einstein's riddle)

10   Fig.26 illustrates the twenty five columns of the generating units of the riddle's project.

Fig.27 illustrates the first interpreted formula of the first requirement of the riddle's constrains.

Fig.28 illustrates the second interpreted formula of the first requirement of the
15   riddle's constrains.

Fig.29 illustrates the interpreted formula of the eighth requirement of the riddle's constrains.

Fig.30 illustrates the final solution for the riddle's project which verifies all the riddle's requirements and constrains.

20   Fig.31 illustrates the ten military units required to be spread in the desert

Fig.32 illustrates the utilized linguistic sentences in the second project of the ten military units.

Fig.33 illustrates the positions of the different squares related to the first placed one.

Fig.34 illustrates the distribution of various columns pertaining to the ten sets of
25   locations of the military units.

Fig.35 illustrates a sample of the user's command to connect unit A and unit H together.

Fig.36 illustrates the interpreted formula for the previous user's command to connect unit A and B.

30   Fig.37 illustrates the first displayed alternative of the second project, wherein the user commands the Creative Machine to start presenting the different alternatives.

Fig.38 illustrates the second displayed alternative, wherein the user commands the Creative Machine to only keep the alternatives with a length of connected units less than 6 units.

35   Fig.39 illustrates the third displayed alternative, wherein the user commands the Creative Machine to keep only the alternative that verifies the connection between unit A and unit B.

Fig.40 illustrates the fourth displayed alternative, wherein the user commands the Creative Machine to keep only the alternatives that verify the connection between unit B
40   and unit I.

Fig.41 illustrates the fifth displayed alternatives, wherein the user commands the Creative Machine to keep only the alternatives ensuring that unit C is in direct view with unit J.

Fig.42 illustrates the sixth displayed alternatives, wherein the user commands the
45   Creative Machine to keep only the alternatives ensuring that unit F is in direct view with unit I.

Fig.43 illustrates the final solution, wherein the user commands the Creative Machine to keep only the alternatives that have a minimum total perimeter of the connected units.

Fig.44 illustrates the columns of the generating units pertaining to the creation of the third project.

Fig.45 illustrates some user's command regarding the radii of level # 9 of the vase.

Fig.46 illustrates the interpreted formula of the previous command of the level # 9.

Fig.47 illustrates some user's command regarding the height of levels numbers six and three.

Fig.48 illustrates the interpreted formula of the previous user's command of the height of levels numbers six and three.

Fig.49 illustrates a group of alternatives for the vase design according to the user requirements related to the radii of the different circles or levels.

Fig.50 illustrates a group of alternatives for the vase design according to the user's requirements related to the height of different circles or levels.

Fig.51 illustrates some final designs that achieve the user's commands and goals.'

Fig.52 illustrates a suggested shaping design for the Creative Machine for the production, wherein the figure shows seven parts of the machine as follows, 01) The LSD screen, 02) The voice microphone, 03) The speaker, 04) The on/off key, 05) The machine cover, 06) The container of the electronic components, 07) The headset connection.

Fig.53 illustrates a second suggested shaping design for manufacturing of the Creative Machine, using most of the same parts of the previous figure.

Best Mode for Carrying Out the Invention

This invention can be produced in a variety of ways to accommodate different user's tasks and needs as follows;

1. As an innovated device assigned for one type of creative achievements such as building designs.

2- As an innovated device dealing with different types of creative achievements, whether visual, audio, rational, or experimental ones.

3- As an electronic appliance functioning by itself, without being connected to any device. In this case, it comprises the four major parts or units previously mentioned in details.

4- As an electronic appliance functioning together with some other devices such as a computer, television set, or mobile phone. In this case, it makes use of the visualization and sound systems of the device.

5- As a sole appliance comprising the four major parts or units of the Creative Machine.

6- As an appliance formed out of two sets wherein the conversational unit is separated from other units and working wirelessly in order to facilitate the user work.

Industrial Applicability

Among the numerous applications that this invention can contribute are the followings ones:

1- In solving logical problems in industry, economy, or even in logical games as in chess games.

2- In musical compositions such as composing some recitals using different musical instruments.

3- In experimental works entailing an accurate organization of numerous experimental trials.

4- In the outer designs of machines or devices, in order to select the most suitable shaping design of each machine or device.

5- In building planning such as distribution of different spaces pertaining to some

building's design, whether the user is an architect or the project's owner.

6- In the interior design of buildings, similar to the appropriate distribution of different furniture pieces inside the various spaces of the building.

7- In designing various pieces of furniture serving different purposes, styles, or usages.

8- In couture styling, by way of attaining innovative fashion with different lines, colors and materials.

9- In sculptural artwork and artistic design using different styles, materials, and techniques.

Claims

1. Making use of any of the notions or functioning methods of this invention by any means.

2. Producing any machine, device, or appliance by any shape to function as an assistant tool for the human using the process of this invention.

3. Producing any machine, device, or appliance to be connected to any other one such as a computer or T.V. set, or a cell phone to function as an assistant tool for the human using the process of this invention.

4. Making use of the usage notion of any of the innovated devices in order to produce software programs to be used with any machine.

5. Making use of the usage notion of any of the four major parts or units of this invention to work tighter in one set or wirelessly in more than one set.

6. Making use of the usage notion of the Generating Units demonstrated in this invention's content to be used by any means, application, or machine.

7. Making use of the usage notion of the Generating Units demonstrated in this invention's content in order to use them in any computer software.

8. Making use of the usage notion of the Conversational Units demonstrated in this invention's content in order to use them in any device or machine so that to carry out any function.

9. Making use of the usage notion of the Conversational Unit demonstrated in this invention's content in order to be used it in any computer software.

10. Making use of the different shaping designs of the invention illustrated in this application.

11. Making use the notion of incorporating the machine and the human in one interactive process to obtain a creational work by any means, as described in this invention.

12. Making use of this invention with any other set, machine, or components, such as printer, 3d screen, or any other electronic means to obtain the final result of the creation in any manner or format.

Fig. 1

A #	Column # 1	2	3
01	B	B	B
02	R	B	B
03	G	B	B
04	B	R	B
05	R	R	B
06	G	R	B
07	B	G	B
08	R	G	B
09	G	G	B
10	B	B	R
11	R	B	R
12	G	B	R
13	B	R	R
14	R	R	R
15	G	R	R
16	B	G	R
17	R	G	R
18	G	G	R
19	B	B	G
20	R	B	G
21	G	B	G
22	B	R	G
23	R	R	G
24	G	R	G
25	B	G	G
26	R	G	G
27	G	G	G

Fig. 2

A#	1st Singer do / Columns#	re	mi	fa	so	la	te	2st Singer do / Columns#	re	mi	fa	so	la	te
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
01	2	2	2	2	2	2	2	2	2	2	2	2	2	2
02	3	2	2	2	2	2	2	3	2	2	2	2	2	2
03	3	2	2	2	2	2	2	2	3	2	2	2	2	2
04	3	2	2	2	2	2	2	2	2	3	2	2	2	2
05	3	2	2	2	2	2	2	2	2	2	3	2	2	2
06	3	2	2	2	2	2	2	2	2	2	2	3	2	2
07	3	2	2	2	2	2	2	2	2	2	2	2	3	2
08	3	2	2	2	2	2	2	2	2	2	2	2	2	3
09	4	2	2	2	2	2	2	4	2	2	2	2	2	2
10	4	2	2	2	2	2	2	3	3	2	2	2	2	2
11	4	2	2	2	2	2	2	2	4	2	2	2	2	2
12	4	2	2	2	2	2	2	3	2	3	2	2	2	2
13	4	2	2	2	2	2	2	2	3	3	2	2	2	2
14	4	2	2	2	2	2	2	2	2	4	2	2	2	2
15	4	2	2	2	2	2	2	3	2	2	3	2	2	2
16	4	2	2	2	2	2	2	2	3	2	3	2	2	2
17	4	2	2	2	2	2	2	2	2	3	3	2	2	2
18	4	2	2	2	2	2	2	2	2	2	4	2	2	2

Fig. 3

Fig. 4

A#	Move # 1 — O	P	Q	R	S	T	M	T	Column # 1	2	3	4	5	6	7	8
01	7H1							3G1
02	7H1							3G1
03	7H1							3G1
04	7H1							3G1
05	7H1							3G1
06	7H1							3G1
07	7H1							3G1
08	7H1							3G1
09	7H1							3G1
10	7H1							3G1
11	7H1							3G1
12	7H1							3G1
13	7H1							3G1
14	7H1							3G1
15	7H1							3G1
16	7H1							3G1

Move # 1 (Columns 9–16):

O	P	Q	R	S	T	M	T	Column # 9	10	11	12	13	14	15	16
8F1							5H1
8F1							5H1
8F1							5H1
8F1							5H1
8F1							5H1
8F1							5H1
8F1							5H1
8F1							5H1
8F1							5H1
8F1							5H1
8F1							5H1
8F1							5H1
8F1							5H1
8F1							5H1
8F1							5H1
8F1							5H1

Move # 3 (Columns 1–8):

O	P	Q	R	S	T	M	T	Column # 1	2	3	4	5	6	7	8
7D1							7G1
7D1							7G1
7D1							7G1
7D1							7G1
7D1							7G1
7D1							7G1
7D1							7G1
7D1							7G1
7D1							7G1
7D1							3G1
7D1							7G1
7D1							7G1
7D1							7G1
7D1							7G1
7D1							7G1
7D1							7G1

Move # 4 (Columns 9–16):

O	P	Q	R	S	T	M	T	Column # 9	10	11	12	13	14	15	16
8F1							8E1
8F1							6E1
8F1							5F1
8F1							5H1
8B1							8E1
8B1							6E1
8B1							5F1
8B1							5H1
6B1							8E1
6B1							6E1
6B1							5F1
6B1							5H1
5C1							8E1
5C1							6E1
5D1							5F1
5C1							5H1

Fig.5

A#	Chemical Substance			
	A	B	C	D
	Column #			
	1	2	3	4
01	0.1	0.1	0.1	0.7
02	0.2	0.1	0.1	0.6
03	0.3	0.1	0.1	0.5
04	0.4	0.1	0.1	0.4
05	0.5	0.1	0.1	0.3
06	0.6	0.1	0.1	0.2
07	0.7	0.1	0.1	0.1
08	0.1	0.2	0.1	0.6
09	0.2	0.2	0.1	0.5
10	0.3	0.2	0.1	0.4
11	0.4	0.2	0.1	0.3
12	0.5	0.2	0.1	0.2
13	0.6	0.2	0.1	0.1
14	0.1	0.3	0.1	0.5
15	0.2	0.3	0.1	0.4
16	0.3	0.3	0.1	0.3
17	0.4	0.3	0.1	0.2
18	0.5	0.3	0.1	0.1

Fig. 6
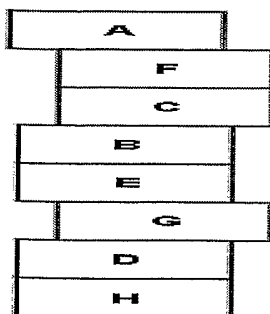
Fig.7
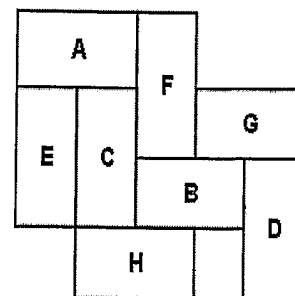
Fig.8
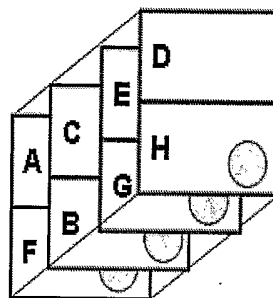
Fig. 9

Tunes #	Time Unit									
	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										

Fig. 10

Tunes #	Time Unit									
	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										

Fig. 11

Tunes #	Time Unit										Recital
	1	2	3	4	5	6	7	8	9	10	
1											A
2											
3											B
4											
5											C
6											

Fig. 12
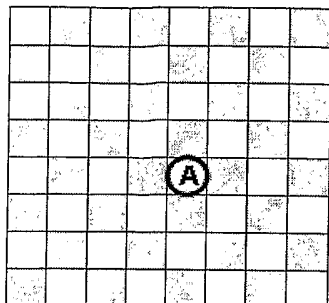
Fig. 13
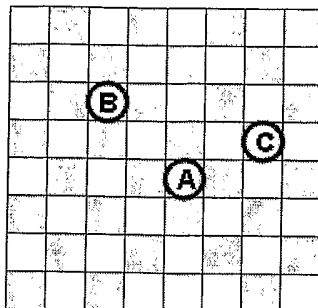
Fig. 14
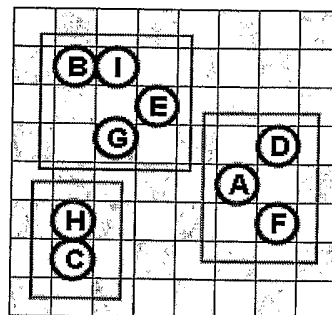
Fig. 15
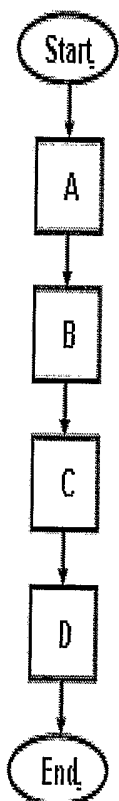
Fig. 16
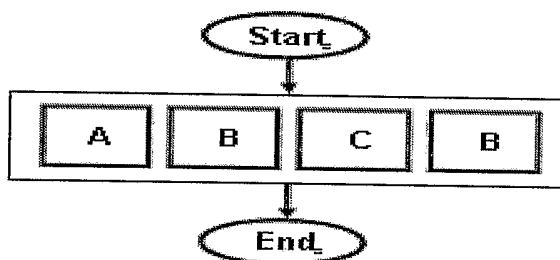
Fig. 17
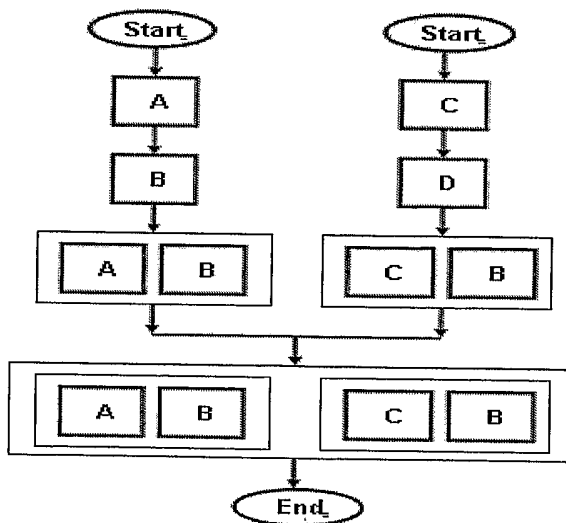
Fig. 18
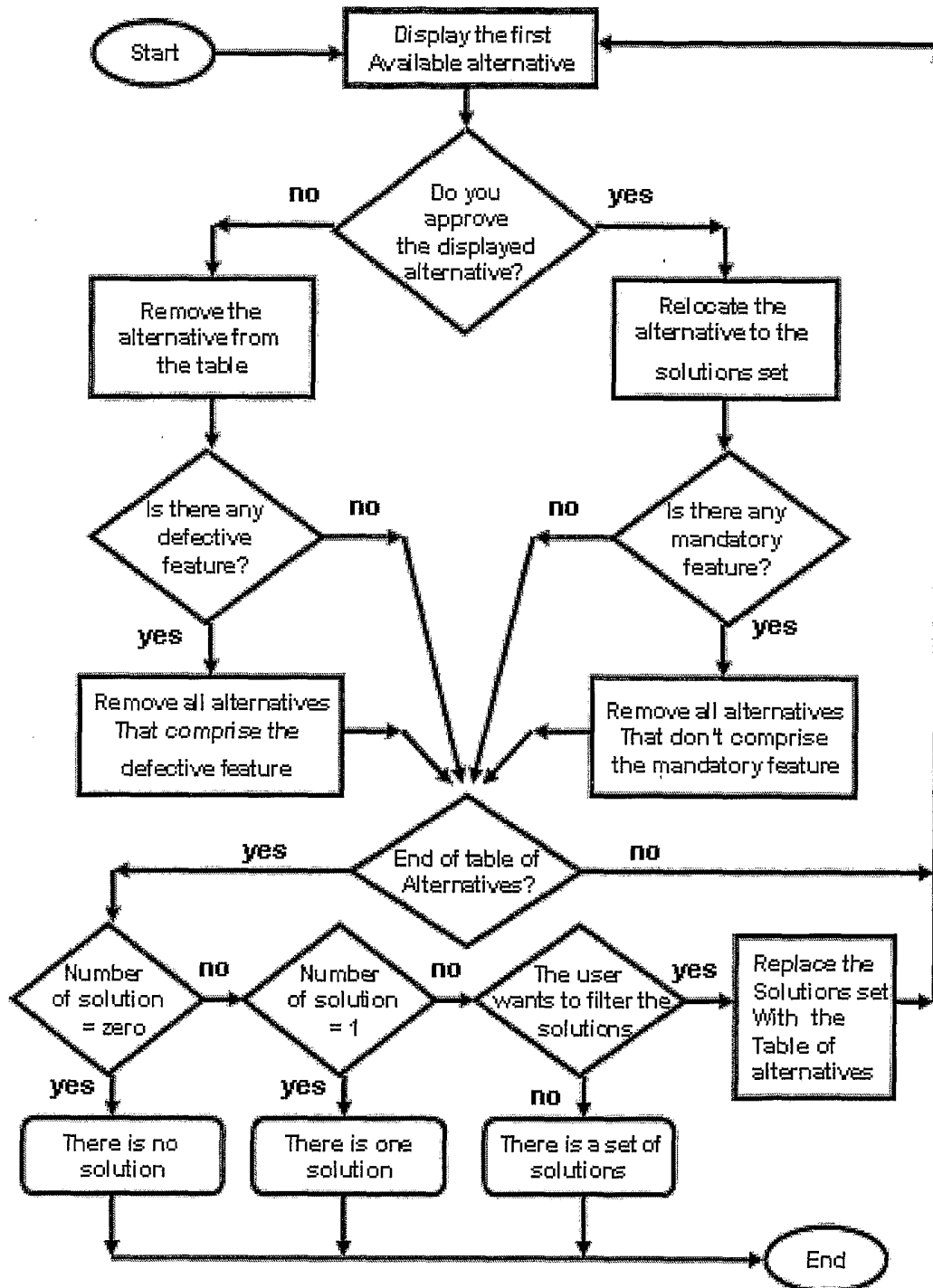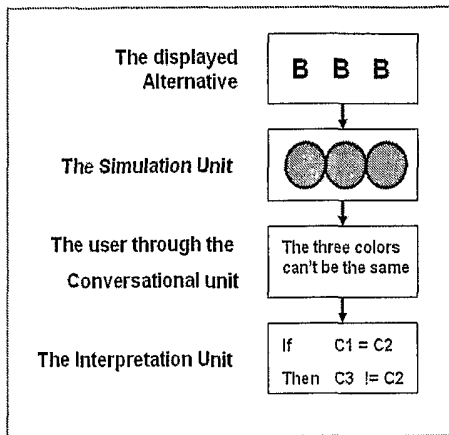
Fig. 20

Columns # 01 + # 02 + # 03 + # 04 + # 05 + # 06 + # 07 =

Columns # 08 + # 09 + # 10 + # 11 + # 12 + # 13 + # 14

Fig. 19

The displayed Alternative	B B B
The Simulation Unit	(three circles)
The user through the Conversational unit	The three colors can't be the same
The Interpretation Unit	If C1 = C2 Then C3 != C2

Fig. 21

	Columns #		
	1	2	3
Elements	G, R, B	G, R, B	G, R, B
Steps	1	3	9
Loops	9	3	1

Fig. 22

	1st Singer						
	do	re	mi	fa	so	la	te
	Columns #						
	1	2	3	4	5	6	7
lements	2..7	2..7	2..7	2..7	2..7	2..7	2..7
Steps	4*0	4*1	4*2	4*3	4*4	4*5	4*6
Loops	4*13	4*12	4*11	4*10	4*9	4*8	4*9

	2st Singer						
	do	re	mi	fa	so	la	te
	Columns #						
	8	9	10	11	12	13	14
	2..7	2..7	2..7	2..7	2..7	2..7	2..7
	4*0	4*1	4*2	4*3	4*4	4*5	4*6
	4*13	4*12	4*11	4*10	4*9	4*8	4*9

Fig. 23

Start → Column #1 → Column #2 → Column #... → Column #n → End of columns — yes → End; no → (back to Column #1)
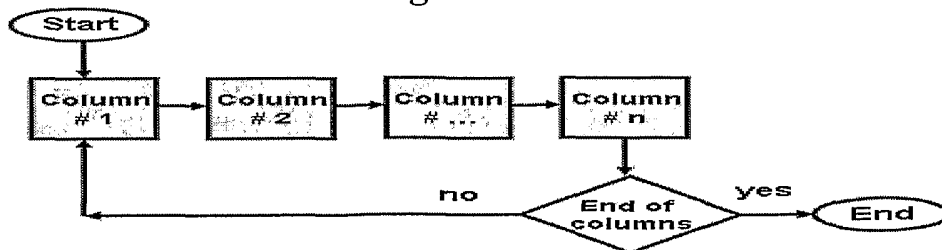
Fig. 24
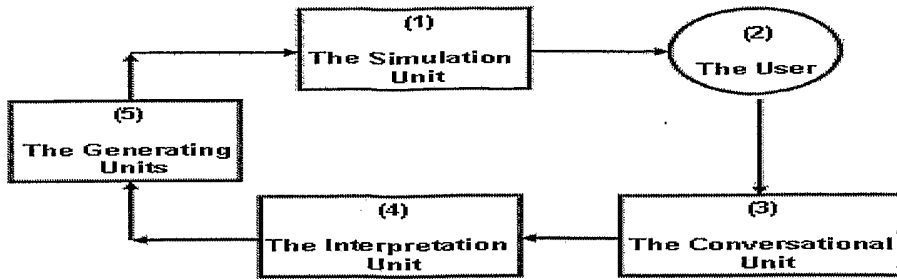
Fig. 25

	House No.				
	1	2	3	4	5
Color					
Nationality					
Beverage					
Cigar					
Pet					

Fig. 26

House # 1	House # 2	House # 3	House # 4	House # 5

Co	Na	Be	Ci	Pe	Co	Na	Be	Ci	Pe	Co	Na	Be	Ci	Pe	Co	Na	Be	Ci	Pe	Co	Na	Be	Ci	Pe

Column #																								

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

Fig. 27

If	Color	=	Red
Then	Nationality	=	Brit

Fig. 28

If	Nationality	=	Brit
Then	Color	=	Red

Fig. 29

Beverage   =   Milk

Fig. 30

	House No.				
	1	2	3	4	5
Color	Yellow	Blue	Red	Green	White
Nationality	Norwegian	Dan	Brit	Germen	Swede
Beverage	White	Tea	Milk	Coffee	Beer
Cigar	Dunhill	Blends	Pall Mall	Princes	Blue Master
Pet	Cats	Horses	Birds	Fish	Dogs

Fig. 31

A	B	C	D	E	F	G	H	I	J
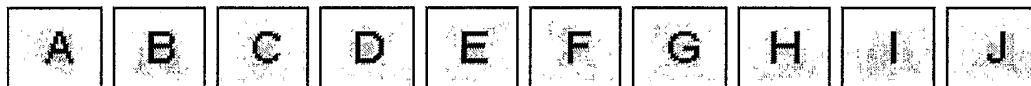
Fig. 32

* Unit (X) must be connected to unit (Y)

* Unit (X) must view unit (Y)

* The length of the connected units

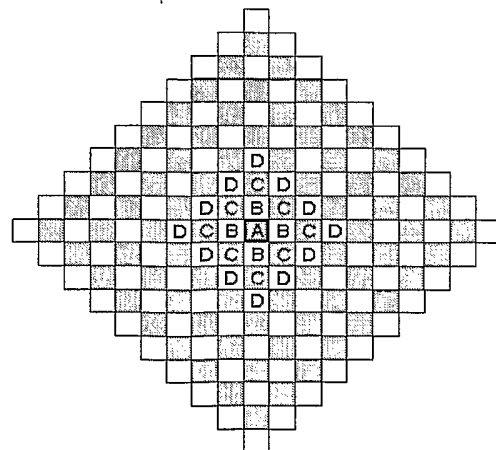* The total perimeter of the connected units

Fig. 33

Fig. 34

Set #																			
1		2		3		4		5		6		7		8		9		10	
1	1	..	4	1	..	8	1	..	12	1	..	16	1	..	20	1	..	24	1	..	28	1	..	32	1	..	36

Fig. 35

Unit (A) must be connected to unit (H)

Fig. 36

If	Set (n)	=	A
Then	Set (n + 1)	=	H

Fig. 37

Start displaying the alternatives

Fig. 38

The length of the connected Units < 6

Fig. 39

A H B C E
F
G
I
K J

Unit (A) must be connected to Unit (H)

Fig. 40

A H B I C
E
F
G
K J

Unit (B) must be connected to Unit (I)

Fig. 41

A H B I
C E
F
K J G

Unit (C) must view Unit (J)

Fig. 42

A H B
I C E
G
F J K

Unit (F) must view Unit (I)

Fig. 43

A H B I C
E
F
G
K J

Unit (B) must be connected to Unit (I)
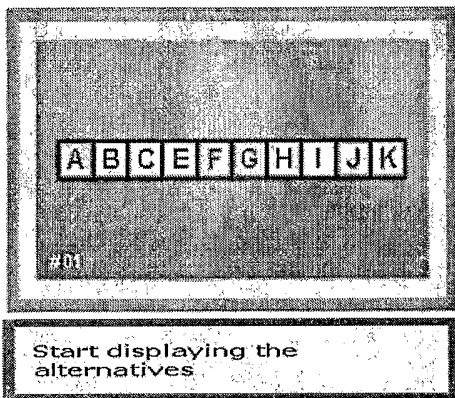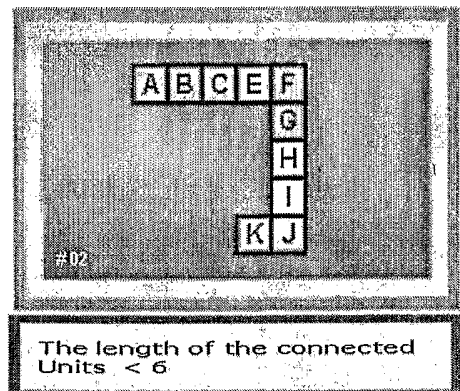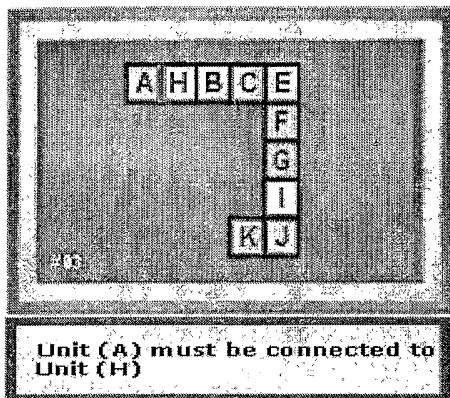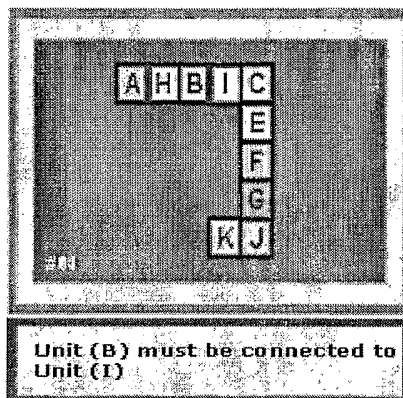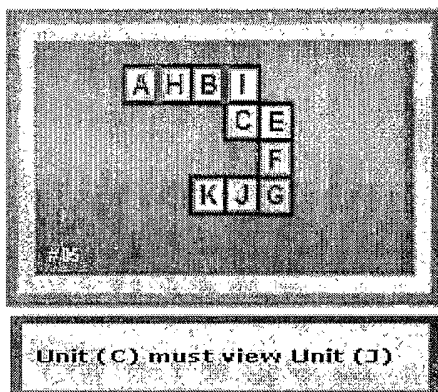
Fig. 44
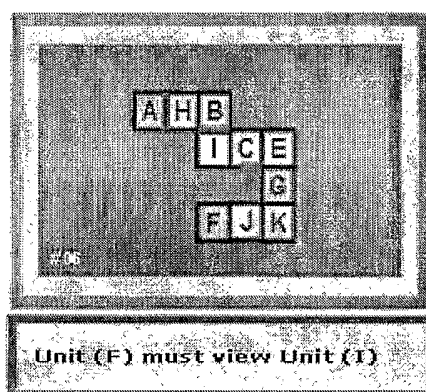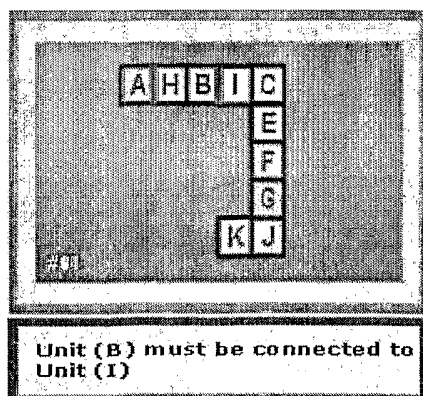
Levels
\multicolumn{2}{c}{1}	\multicolumn{2}{c}{2}	\multicolumn{2}{c}{3}	\multicolumn{2}{c}{4}	\multicolumn{2}{c}{5}	\multicolumn{2}{c}{6}	\multicolumn{2}{c}{7}	\multicolumn{2}{c}{8}	\multicolumn{2}{c}{9}	\multicolumn{2}{c}{10}
r	h	r	h	r	h	r	h	r	h	r	h	r	h	r	h	r	h	r	h
Columns #
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Fig. 45

The radius of level # 9 < 5

Fig. 46

R9 < 9

Fig. 47

The height of level # 6 is greater than # 3
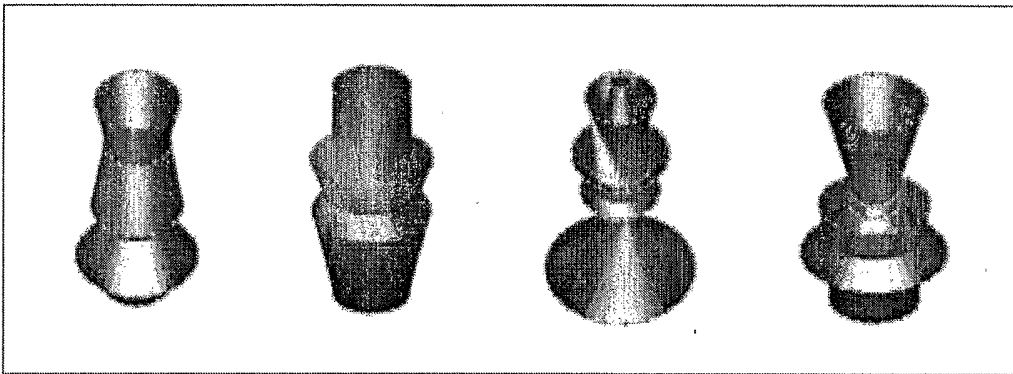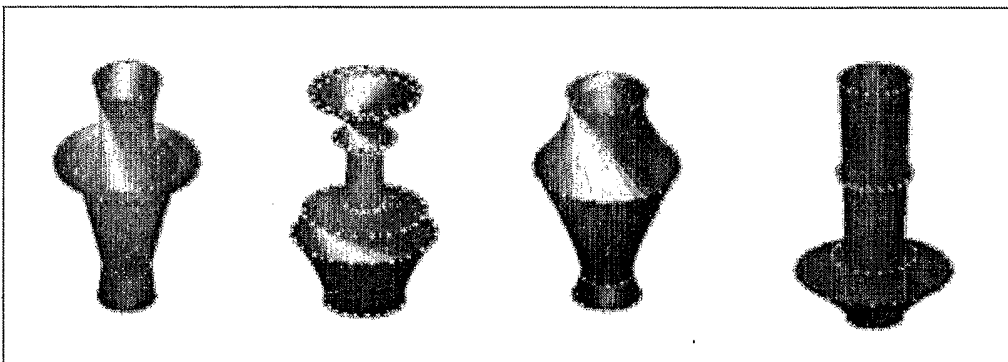
Fig. 48
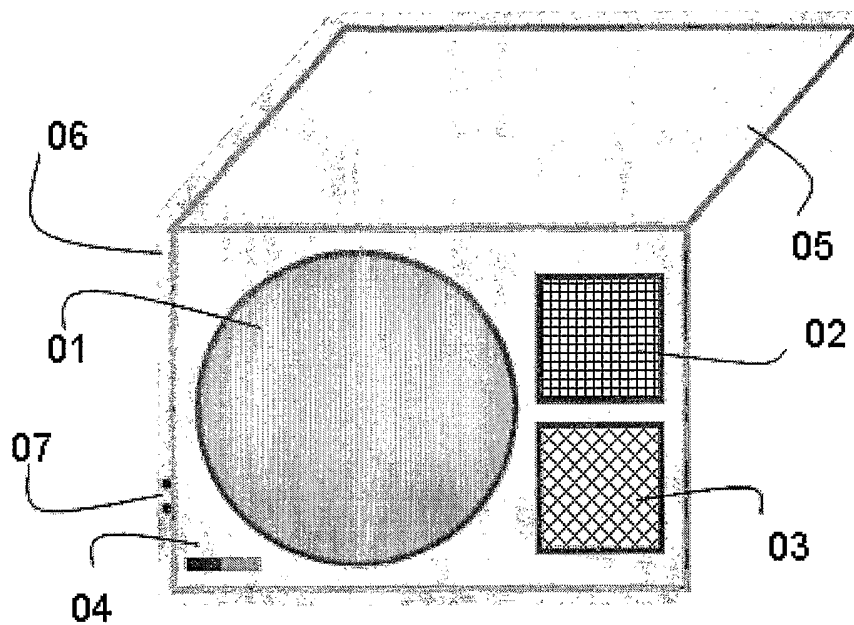
H6 > H3

Fig. 49
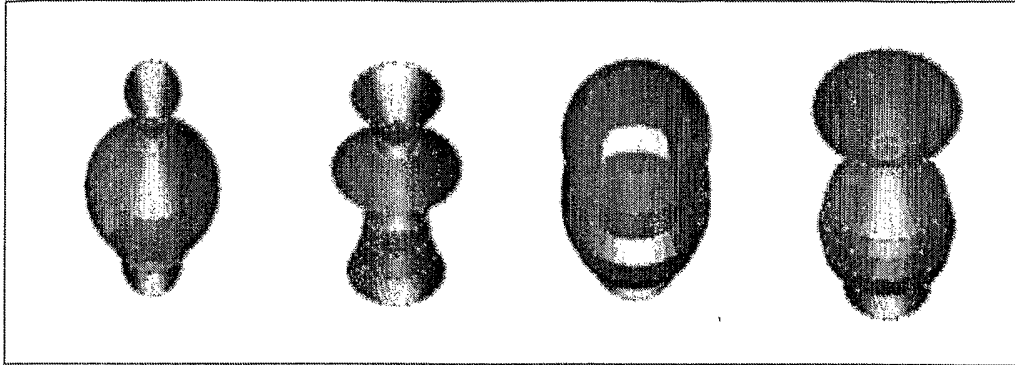
Fig. 50

Fig. 51

Fig. 52

Fig. 53
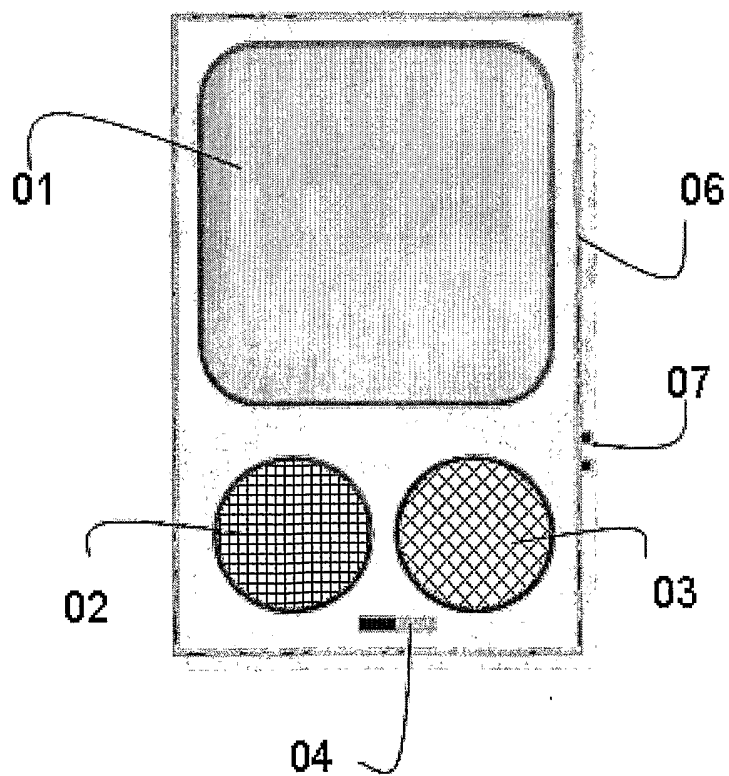
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC[8]: **G06Q 99/00** (2006.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC[8]: G06Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
----

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPODOC, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,297,054 A (KIENZLE ET AL.) 22 March 1994 (22.03.1994) *Whole document, specially fig. 1 and 3*	1 - 12
X	WO 1997/015886 A1 (CALICO ET AL.) 1 May 1997 (01.05.1997) *Whole document*	1 - 12
X	US 5,754,738 A (SAUCEDO ET AL.) 19 May 1998 (19.05.1998) *Whole document*	1 - 12

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 March 2006 (14.03.2006)	31 March 2006 (31.03.2006)

Name and mailing address of the ISA/ AT	Authorized officer
Austrian Patent Office Dresdner Straße 87, A-1200 Vienna	BEZIRGAN A.
Facsimile No. +43 / 1 / 534 24 / 535	Telephone No. +43 / 1 / 534 24 / 572

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INTERNATIONAL SEARCH REPORT

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,103,421 A (WARD ET AL.) 7 April 1992 (07.04.1992) *Whole document* --	1 - 12
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