

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WILLIAM POSSIDENTO

Appeal No. 2005-1379
Application 09/734,601

ON BRIEF

Before WARREN, KRATZ and PAWLIKOWSKI, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

Decision on Appeal

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner finally rejecting claims 5 through 8, all of the claims in the application.

Claim 5 illustrates appellant's invention of a two part teaching puzzle apparatus and is representative of the claims on appeal:

5. A two part teaching puzzle apparatus based upon the periodic chart of chemical elements that provides an array of rows and columns of said chemical elements; where the location of each element in the array is based upon its chemical properties, the apparatus comprising: a first part puzzle board having a top edge, a bottom edge and two side edges, said edges having an outline shape reflective of said periodic chart, a second part comprising a plurality of cubic shaped pieces, each piece having six faces, each of said pieces corresponding to a chemical element in the periodic table and having information on at least one of said faces of said cubic shape pertaining to the chemical name of a given element, said puzzle board having shape for accommodating an array of said cubes that reflects the configuration of said periodic chart.

The references relied on by the examiner are:

Midgley	3,594,923	Jul. 27, 1971
Gaines (Patent Specification, United Kingdom)	85,299	Dec, 29, 1868
Hun (Patent Specification, United Kingdom)	1 498 951	Jan. 25, 1978

The examiner has rejected appealed claims 5 through 7 under 35 U.S.C. § 103(a) as being unpatentable over Midgley in view of Gaines (final action mailed November 27, 2002 (hereinafter final action), pages 2-3), and claim 8 under 35 U.S.C. § 103(a) as being unpatentable over Midgley in view of Gaines, and further in view of Hun (final action, page 3).¹

Appellant states that appealed claims 5 and 6 are separately argued and merely describes the limitations of appealed claims 7 and 8 (brief, page 5). The examiner finds that appellant has not presented separate argument with respect to claims 7 and 8 (answer, pages 2-3). Thus, we decide this appeal based on appealed claims 5, 6 and 8 as representative of the grounds of rejection and appellant's grouping of claims. 37 CFR § 1.192(c)(7) (2003); *see also* 37 CFR § 41.37(c)(1)(vii) (September 2004).

We affirm.

Rather than reiterate the respective positions advanced by the examiner and appellant, we refer to the answer and to the brief for a complete exposition thereof.

Opinion

We have carefully reviewed the record on this appeal and based thereon find ourselves in agreement with the supported position advanced by the examiner that, *prima facie*, the claimed two part teaching puzzle apparatus encompassed by appealed claims 5 and 6 would have been obvious over the combined teachings of Midgley and Gaines to one of ordinary skill in this art at the time the claimed invention was made. Accordingly, we again evaluate all of the evidence of obviousness and nonobviousness based on the record as a whole, giving due consideration to the weight of appellant's arguments in the brief. *See generally, In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984).

¹ We consider the supplemental answer mailed August 24, 2004. The examiner states in the answer that the grounds of rejection are set forth in the final action (page 3).

Our consideration of the first ground of rejection under § 103(a) requires that we initially interpret appealed claims 5 and 6 by giving the terms thereof the broadest reasonable interpretation in their ordinary usage as they would be understood by one of ordinary skill in the art in light of the written description in the specification, including the drawings, as interpreted by this person, unless another meaning is intended by appellant as established in the written description of the specification, and without reading into the claims any limitation or particular embodiment disclosed in the specification. *See, e.g., In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). We determine that the plain language of independent claim 5 specifies a two part teaching puzzle apparatus comprising at least a puzzle board with edges having an outline shape reflective of the “periodic chart,” that is, “based upon the periodic chart of chemical elements that provides an array of rows and columns of said chemical elements; wherein the location of each element is based upon its chemical properties,” the “puzzle board having a shape accommodating an array of said cubes that reflects the configuration of said periodic chart;” and a plurality of cubic shaped pieces, that is, “cubes,” each of which corresponds to a chemical element of the periodic chart and has on at least one face information pertaining to the chemical name of an element.

We determine that one of ordinary skill in this art would consider the term “periodic chart” to include the well known periodic *table* of chemical elements. Indeed, appellant states in the written description in the specification that the disclosed puzzle is based on the periodic table of chemical elements (e.g., page 1, ll. 6-15, page 3, ll. 17-26, and page 5, ll. 9-11). The periodic table is generally presented in the scientific literature, including textbooks, in several ways. First, as illustrated in specification **Fig. 1**, with elements 57 and 89 positioned as shown therein, again with a suitable notation that the sequences of the remaining fourteen (14) elements in the Lanthanide series and the Actinide series follows Cesium, element 58, and Thorium, element 59, respectively.² We find with respect to this representation, that appellant refers to the remaining fourteen (14) elements of the Lanthanide series and the Actinide series as the Cesium and

² *See, e.g.,* Amos Turk et al. (Turk), *Introduction to Chemistry*, p. 48 (Academic Press, New York, 1968) (copy attached).

Thorium series, respectively (specification, page 4, ll. 1-7).³ Second, with the positions of the elements lanthanum, element 57, and actinium, element 89, at the beginning of the sequences of the fifteen (15) elements in each of the Lanthanide series and the Actinide series, respectively, with the position of these series in the transition elements suitably noted.⁴ And third, with the periodic table separated into parts for teachings purposes, including separate blocks for the Transition Elements and the Cesium and Thorium series.⁵

We find no basis in the claim language or in the written description in the specification on which to read the “periodic chart” illustrated in specification **Fig. 1** as a limitation into claim 5, *see, e.g., Morris*, 127 F.3d at 1054-55, 44 USPQ2d at 1027; *Zletz*, 893 F.2d at 321-22, 13 USPQ2d at 1322, and one of ordinary skill in this art would consider the term “periodic chart” in claim 5 to include any “chart” representing the periodic table as presented in any manner in the scientific literature, including textbooks. Thus, we interpret the claim language “having an outline shape reflective of said periodic chart” to include any manner of shape that conforms to the general outline of a periodic table, including an ordinary page to accommodate the periodic table including the Cesium and Thorium series as presented in Turk (page 50).

The puzzle board, shaped as specified, can further be of any shape that accommodates an array of the cubic shaped pieces having six faces, such as in the shape of a cube, to reflect the configuration of the periodic chart, without specifying the size of any or all of the cubic shaped pieces or the manner in which the accommodation must be made. Thus, the puzzle board can be of a flat shape, such that the cubic shaped pieces can be laid thereon or attached thereto in any manner to form an array, or can be of another shape, such as with trays or shelves to hold the cubic shaped pieces in an array, in addition to a shape having depressions to hold the cubic shaped pieces. The only information required on the cubic shaped piece is any information pertaining to the chemical name of the element, which can be simply the chemical symbol for that element.

³ *See, e.g., Turk*, page 51, note “*” (copy attached).

⁴ *See, e.g., Robert Thorton Morrison et al., Organic Chemistry*, inside rear cover (3rd ed., Boston, Allyn and Bacon, Inc. 1973) (copy attached).

⁵ *See, e.g., Turk*, page 50 (copy attached).

We determine that appealed claim 6, dependent on appealed claim 5, specifies that the puzzle board comprises at least a main section accommodating a 3 row x 18 column array of cubic shaped pieces with a 2 row x 2 column array of such pieces on the upper lefty corner and a 2 row x 6 column array of such pieces on the upper right hand corner. These configurations do not accommodate a single cubic shaped piece or an array of such pieces for 1 row x 1 column for elements 1, hydrogen, and 2, helium, and the 1 row x 6 column for elements 87, 88, 89, 104, 105 and 106 shown in the main section of the table illustrated in specification **Fig. 1**, or the separate 2 row x 14 column array for elements of the Cesium and Thorium series also shown thereon. However, the open-ended term “comprising” opens claim 6 to encompass puzzle boards that accommodate at least the specified configurations of cubic shaped pieces and further accommodate any additional cubic shaped pieces in configurations attached to the specified configurations or in separate configurations. *See generally, Vehicular Technologies Corp. v. Titan Wheel Int’l Inc.*, 212 F.3d 1377, 1383, 54 USPQ2d 1841, 1845 (Fed. Cir. 2000); *Genentech Inc. v. Chiron Corp.*, 112 F.3d 4954, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997); *Exxon Chem. Pats., Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1555, 35 USPQ2d 1801, 1802 (Fed. Cir. 1995) (“The claimed composition is defined as comprising - meaning containing at least - five specific ingredients.”); *In re Baxter*, 656 F.2d 679, 686 210 USPQ 795, 802 (CCPA 1981).

Turning now to the first ground of rejection, the examiner finds that Midgley would have taught that a board having the periodic table displayed thereon as illustrated in Midgley **FIGs. 6 and 7** which has arrays arranged as in the period table and “means for accommodating cards 25 having information thereon pertaining to the chemical elements,” but in comparison with appealed claims 5 and 6 fail to disclose that “pieces 25 have a cubic shape” (final action, page 2). The examiner further finds that Gaines would have disclosed “a teaching device comprising a plurality of cubes which represent chemical elements” (*id.*, pages 2-3). On this basis, the examiner concludes that it would have been *prima facie* obvious to one of ordinary skill in this art “to modify the device disclosed by Midgley by providing cube pieces to represent the elements rather than cards” for that purpose as taught by Gaines (*id.*, page 3).

Appellant submits that Gaines would not have suggested modifying the “wall chart of Midgley into block shapes for each element and a puzzle board of shape reflecting the periodic table of chemical elements,” pointing out that Gaines was issued prior to the conception of the

periodic table, and thus, there is no teaching in the reference of the correspondence between one cubic piece and an element of the periodic table (brief, pages 6-7). Appellant further argues in this respect that “to arrange the cubes of Gaines into a period chart would violate the express teachings of Gaines” to arrange cubes representing elements into molecules (*id.*, pages 7-8). Appellant further submits that the applied prior art does not suggest “to modify the compartments of Gaines into the shape and size required for a periodic table” because the compartments of Gaines are used to “gather” and store the cubic pieces for each element, citing col. 1, l. 53, and col. 2, ll. 31-36 of the reference (brief, page 9). Appellant thus argues that Midgley would not benefit by “making compartments to hold cubic pieces into the shape of the period table” (*id.*, page 10). Appellant also submits that the combination of Midgley and Gaines would result in the claimed invention because Gaines would have taught that one compartment holds all of the cubes for one chemical element (*id.*, pages 10-11). On this basis, appellant contends that even if Gaines did teach “that a puzzle board of periodic shape, such as the applicant’s, can be made” there is no teaching in Gaines suggesting that it would function like appellant’s since the cubic shapes of the reference are all of different sizes and “the cubes of the applicant’s invention must be all of the same size so that all the elements may fit in the period table that is defined by the contours of the . . . puzzle board of the invention” (*id.*, page 11).

Appellant submits that “the specific shaped arrays that are described in detail in claim 6 are not shown or suggested by” Gaines and Midgley, contending that Gaines does not describe the period table and the arrays specified in claim 6 “reflect those particular patterns that are found in the modern day periodic table;” and that the compartments of Gaines are used “for storage and not to represent the shape of the various sections of the periodic table (*id.*, pages 11-12). Appellant finally submits that combination of references would not produce the claimed invention because the cubes of Gaines are of dissimilar size and there are a plurality of cubes for each element, and Midgley “has to do with a wall chart and does not concern itself with cubic shapes” (*id.*, pages 13-14).

The examiner responds, with respect to appealed claim 5, that “[b]oth Midgley and Gaines are directed to systems for teaching chemistry” and that “Gaines is not being read in light of Midgley” (answer, pages 3-5). The examiner argues that Midgley teaches the concepts that appellant contends is absent in Gaines, pointing out that Midgley discloses “replaceable pieces

which are the same size, each chemical element being represented by one piece for the purposes of facilitating arrangement of the shapes into a periodic table,” and Gaines is relied on for the “teaching of cubic shapes representing the elements” (*id.*, pages 4-5). The examiner argues, with respect to claim 6, that “[t]he shape of the periodic chart was well known at the time of filing the present application” and “Midgley discloses in Figure 6 that its device comprises a periodic chart having” arrays (*id.*, pages 5-6). On this basis, the examiner maintains the position that the combined teachings of Midgley and Gaines would have suggested the claimed invention.

We find that Midgley would have disclosed to one of ordinary skill in this art a teachings aid that is “in the form of a wall chart periodic table” as shown in Midgley **FIGs. 6 and 7**, which chart “embodies a modified, simplified periodic table,” and that “the same arrangement can be used with a standard periodic table” (col. 3, ll. 37-43; see also col. 1, ll. 26-35). We further find that one of ordinary skill in the art would have inferred from the teachings of Midgley that the chart would be useful if laid on a table, and indeed, an element identification card **25**, containing the symbol of an element, can be attached to the appropriate position in the chart in such position (col. 3, ll. 44-50, and col. 2, ll. 54-62).⁶ We further find that Gaines would have disclosed a system in which the atoms and simple elementary bodies known at that time to be useful are assigned numbers based on hydrogen and represented by cubes for each element, the cube at least marked by the number assigned to the atom or elementary body and sized to represent the weight thereof (page 1, cols. 1 and 2). Gaines teaches that the cubes are stored in compartments in a box, the lid of which is provided with trays or shelves to hold the cubes arranged to represent chemical combinations (*id.*).

We find in the combined teachings of Midgley and Gaines substantial evidence in support of the examiner’s position that the claimed invention encompassed by appealed claims 5 and 6, as we have interpreted these claims above, would have been obvious over this combination of references to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103(a). We agree with the examiner that appellant’s arguments with respect to Gaines do not

⁶ It is well settled that a reference stands for all of the specific teachings thereof as well as the inferences one of ordinary skill in this art would have reasonably been expected to draw therefrom, *see In re Fritch*, 972 F.2d 1260, 1264-65, 23 USPQ2d 1780, 1782-83 (Fed. Cir.

establish otherwise. Indeed, the examiner correctly argues that the combined teachings of the references must be considered for what the combination would have reasonably suggested to one of ordinary skill in this art, not for the individual teaching of either reference or whether one reference can be incorporated into the other reference, relying on the authority of *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981) (“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.”).

The evidence establishes, as the examiner argues, that one of ordinary skill in this art would have found in Gaines the teaching that a cube with identifying information can be used to represent a chemical element in a teaching aid for an organized system, and would have reasonably been led thereby to substitute this identifying piece in place of the card containing such information in the teaching aid for the periodic table, an organized system, as taught by Midgley. *See, e.g., In re Siebentritt*, 372 F.2d 566, 567-68, 152 USPQ 618, 619 (CCPA 1967) (express suggestion to interchange methods which achieve the same or similar results is not necessary to establish obviousness). While appellant correctly points out that the embodiment of Midgley relied on by the examiner is a wall chart, we found above that one of ordinary skill in this art would have recognized that the chart can function as intended when laid flat on a table. Indeed, appealed claim 5 encompasses a puzzle apparatus which is flat and the cubic shaped pieces can be placed thereon.

We further find that, as the examiner argues and appellant acknowledges in the specification, the well known periodic table was represented in Midgley in a standard manner. Indeed, as we found above, Midgley would have taught that a standard periodic table can be used in place of the modified, simplified periodic table illustrated in **FIGs. 6 and 7**. We interpreted appealed claim 6 above to encompass a puzzle apparatus having any standard periodic table which contains the specified arrays as well as the additional arrays that are included in that table.

1992); *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968), presuming skill on the part of this person. *In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985).

Accordingly, based on our consideration of the totality of the record before us, we have weighed the evidence of obviousness found in the combined teachings of Midgley and Gaines with appellant's countervailing evidence of and argument for nonobviousness and conclude that the claimed invention encompassed by appealed claims 5 through 7 would have been obvious as a matter of law under 35 U.S.C. § 103(a).

We find that appellant has also addressed the second ground of rejection of claim 8 based on the combined teachings of Midgley, Gaines and Hun with the arguments with respect to the teachings of Midgley and Gaines that we considered above (brief, page 5). Accordingly, on the same basis, we conclude that the claimed invention encompassed by appealed claim 8 would have been obvious as a matter of law under 35 U.S.C. § 103(a).

The examiner's decision is affirmed.

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Application 09/734,601

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv) (September 2004).

AFFIRMED

CHARLES F. WARREN)	
Administrative Patent Judge)	
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PETER F. KRATZ)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
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