Date	March 21, 2017	Court	Intellectual Property High Court, Fourth Division
Case number	2016 (Gyo-Ke) 10186		

– A case in which the court found that any person ordinarily skilled in the art could not have easily conceived of Invention 1 titled "friction heat-based thermochromic writing implement and a friction heat-based thermochromic set making use thereof" by holding that such person does not have any motive to combine Cited Invention 1 and Cited Invention 2, and that, even if such person could have easily conceived of the idea of combining the two, said idea alone would not lead to the structure of Invention 1 that constitutes Difference 5, and therefore that, even if such person is motivated to apply the structure specified in Cited Document 3, such person would have been required to make significant effort to arrive at the structure of Invention 1 that constitutes Difference 5 by going through the aforementioned two steps based on Cited Invention 1.

References: Article 29, paragraph (2) of the Patent Act

Numbers of related rights, etc.: Patent No. 4312987 (the "Patent"), Publication of Unexamined Patent Application No. 2001-207101 (Cited Invention 1), Publication of Unexamined Patent Application No. 1995-241388 (Cited Invention 2), Publication of Unexamined Patent Application No. 1982-115397 (Cited Invention 3), Invalidation Trial No. 2014-800128 (Invalidation Trial Decision)

Summary of the Judgment

1. Regarding a request for a trial for invalidation of a patent for an invention (the "Invention") titled "friction heat-based thermochromic writing implement and a set making use thereof," the JPO made a decision that, since any person ordinarily skilled in the art could have easily made Invention 1 based on the technical information stated in Cited Invention 1, Cited Invention 2, Cited Invention 3, etc., Invention 1 cannot be patented under Article 29, paragraph (2) of the Patent Act.

2. On the other hand, in this judgment, the court rescinded the JPO decision by holding that it would not be possible for any person ordinarily skilled in the art to have easily conceived of Invention 1 as follows.

(1) Since Cited Invention 1 is considerably different from Cited Invention 2 in terms of the structure and the function of generating handwriting, it is almost impossible to think that any person ordinarily skilled in the art could have conceived of the idea of combining Cited Invention 1 with Cited Invention 2.

(2) Even if any person ordinarily skilled in the art combined Cited Invention 1 with Cited Invention 2, since Friction Device 9 of Cited Invention 2 is independent from a

writing instrument, such person would have only conceived of the structure of providing a writing instrument of Cited Invention 1, together with a separate device, namely, Friction Device 9 (friction body), equipped with a friction portion consisting of either elastomer or a plastic foam, and would not have arrived at the structure of the Invention that constitutes Difference 5, which, in other words, is the structure of providing a writing instrument together with a friction body attached to the end portion of the instrument or to the top of the cap of the instrument in an integrated manner.

Cited Document 3, etc. merely provides information about the structure of attaching something to erase the handwriting such as an eraser to the end part of writing instrument or to the cap of the instrument.

On the other hand, Friction Device 9 of Cited Invention 2 is designed to use friction heat to erase colored-ink handwriting written by a reversible thermochromic ink composition consisting of color holding-type reversible thermochromic microcapsule pigment that can keep a colored state in a temperature range below the lower-temperature-side point of color change or a colorless state in a temperature range above the higher-temperature-side point of color change. Friction Device 9 is different, in nature, from something simply designed to erase handwriting. Furthermore, it cannot be considered that any person ordinarily skilled in the art was familiar with the structure of attaching a friction body to the end portion of a writing instrument or to the cap of the instrument. It is also impossible to consider that, in search of how to provide Friction Device 9, any person ordinarily skilled in the art was motivated to apply the structure of attaching a simple handwriting-eraser, which is different from Friction Device 9 in nature, to the end portion of a writing instrument or to the cap of the instrument as stated in Cited Document 3, etc.

(3) Even if it is assumed that any person ordinarily skilled in the art conceived of the idea of attaching Friction Device 9 to the end portion of a writing instrument or to the cap of the instrument, such person would be able to arrive at the structure of Invention 1 that constitutes Difference 5 only after conceiving of the idea of combining Cited Invention 1 and Cited Invention 2 and providing, together with a writing instrument, a "friction body consisting of either elastomer or a plastic foam that is designed to erase the colored-ink handwriting by use of friction heat," and then, conceiving of the idea of attaching the friction body (Friction Device 9) to the writing instrument itself or to the cap thereof as a means to provide a friction body. In this way, such person would have been required to make significant effort to arrive at the structure of Invention 1 that constitutes Difference 5 by going through the aforementioned two steps based on Cited Invention 1. Thus, it cannot be considered that any person ordinarily skilled in the art

could have easily conceived of said structure.

Therefore, any person ordinarily skilled in the art cannot be considered to have easily conceived of the structure of Invention 1 that constitutes Difference 5.

Judgment rendered on March 21, 2017; the original was received on the same day; court clerk
2016 (Gyo-Ke) 10186, Case of Seeking Rescission of JPO Decision
Date of conclusion of oral argument: February 21, 2017

Judgment

Plaintiff: Pilot Ink Company, Limited

Plaintiff: Pilot Corporation

Defendant: Mitsubishi Pencil Co., Ltd

Main text

1. The JPO decision made on June 28, 2016, concerning Invalidation Trial No. 2014-800128, shall be rescinded with regard to the parts concerning Claims 1, 5 to 7, and 9 of Patent No. 4312987.

2. The defendant shall bear the court costs.

Facts and reasons

No. 1 Claims

Same as paragraph 1 of the main text.

No. 2 Outline of the case

1. Developments in procedures at the JPO, etc.

(1) On January 25, 2002, one of the plaintiffs, Pilot Ink Company, Limited, filed a patent application for an invention titled "friction heat-based thermochromic writing implement and a friction heat-based thermochromic set making use thereof" (Patent Application No. 2002-17005; priority date: November 12, 2001; priority country: Japan), and a patent granted for this invention was registered on May 22, 2009 (Patent No. 4312987; the number of claims: 10; Exhibit Ko 1). Hereinafter this patent is referred to as the "Patent."

(2) On July 7, 2010, the other plaintiff, Pilot Corporation, acquired by transfer part of the patent right based on the Patent, and completed registration of partial transfer by reason of specified succession (Exhibit Ko 100).

(3) On July 31, 2014, the defendant filed a request for an invalidation trial for the inventions based on Claims 1 to 9 of the Patent (Exhibit Ko 82), and the JPO examined the case of this request as Invalidation Trial No. 2014-800128. On March 4, 2016, the plaintiffs filed a request for correction to delete Claims 2 to 4 and 8, among others (the number of claims: 6; Exhibit Ko 94; hereinafter referred to as the "Correction").

(4) On June 28, 2016, the JPO rendered a decision, as specified in the copy of the written decision attached hereto, to accept the Correction and dismiss the request for an invalidation

trial regarding the inventions based on Claims 2 to 4 and 8, while invalidating the patent regarding the inventions based on Claims 1, 5 to 7, and 9 (the "JPO Decision"). On July 7, 2016, certified copies of the JPO Decision were served upon the plaintiffs.

(5) On August 8, 2016, the plaintiffs filed this action to seek rescission of the JPO Decision regarding Claims 1, 5 to 7, and 9.

2. Statement of the scope of claims

Claims 1, 5 to 7, and 9 of the patent after the Correction are as stated below (Exhibit Ko 94). Hereinafter, the inventions based on these claims are referred to respectively as "Invention 1" and the like, and collectively as the "Invention." The description of the patent after the Correction (Exhibit Ko 94) is referred to as the "Description."

[Claim 1] A friction heat-based thermochromic writing implement which is filled with reversible thermochromic ink wherein reversible thermochromic microencapsulated pigment with the point of discoloration on the lower-temperature side within the range between -30°C and +10°C, the point of discoloration on the higher-temperature side within the range between 36°C and 65°C, and the average particle size within the range between 0.5 and 5 μm is dispersed in an aqueous medium, and which is characterized by producing a thermochromic handwriting that changes, by friction heat produced by a friction body, from the first state at any temperature not higher than the point of discoloration on the higher-temperature side to the second state, and then tautomerically changes to the first state as a result of a drop in temperature from the second state, wherein: tautomeric changes can be made between the first colored state and the second colorless state; the reversible thermochromic microencapsulated pigment is a color-holding type that can tautomerically hold the colored state or decolored state within a specific temperature range; the handwriting with the ink when written is in the first state at a room temperature (25°C); and a friction body selected from between elastomer and plastic foam and designed to decolor the handwriting with the ink by friction heat is put on the bottom of the writing implement or the top of its cap.

[Claim 5] A friction heat-based thermochromic writing implement stated in Claim 1 wherein the first state is black.

[Claim 6] A friction heat-based thermochromic writing implement stated in Claim 1 or 5 wherein the reversible thermochromic ink is shear thinning ink containing a shear thinning substance, and is used to fill a ball-point pen-type writing implement.

[Claim 7] A friction heat-based thermochromic writing implement stated in Claim 1 or 5 wherein the reversible thermochromic ink is aggregate-type ink comprising reversible thermochromic microencapsulated pigment suspended and loosely aggregated by means of a water-soluble polymer coagulant, and is used to fill a writing implement comprising a processed fiber body as a pen body and a bundle of fibers as an ink absorber.

[Claim 9] A friction heat-based thermochromic writing implement stated in Claim 1, 5, 6 or 7 wherein the reversible thermochromic microencapsulated pigment is pigment which contains a reversible thermochromic composition containing, at least, (a) an electron-donating color-showing organic compound, (b) an electron-accepting compound, and (c) a reaction medium that determines the temperature at which color reaction between (a) and (b) takes place, wherein the microcapsule has a non-circular cross section, and the ratio of the reversible thermochromic composition to the wall film is within the range between 7/1 and 1/1 (by weight).

3. Summary of the reasons for the JPO Decision

(1) The reasons of the JPO Decision, which are as stated in the copy of the written decision attached hereto, can be summarized as follows: Inventions 1, 5, and 7 could have been easily made by a person ordinarily skilled in the art based on the invention disclosed in Cited Document 1 mentioned in A. below (hereinafter referred to as "Cited Invention 1") and the invention disclosed in Cited Document 2 mentioned in B. below (hereinafter referred to as "Cited Invention 2"), as well as the technical matters disclosed in the cited documents mentioned in C, D, F to H below; Inventions 6 and 9 could have been easily made by a person ordinarily skilled in the art based on Cited Inventions 1 and 2, as well as the technical matters disclosed in the cited documents mentioned in C to H below; and therefore, all of these inventions are unpatentable under Article 29, paragraph (2) of the Patent Act.

A. Cited Document 1: Publication of Unexamined Patent Application No. 2001-207101 (Exhibit Ko 2)

B. Cited Document 2: Publication of Unexamined Patent Application No. 1995-241388 (Exhibit Ko 3)

C. Cited Document 3: Publication of Unexamined Patent Application No. 1982-115397 (Exhibit Ko 9)

D. Cited Document 4: CD-ROM in which the description and drawings attached to Utility Model Application No. 1991-77739 (Publication of Unexamined Utility Model Application No. 1993-24395) are recorded (Exhibit Ko 12)

E. Cited Document 5: Publication of Unexamined Patent Application No. 1997-124993 (Exhibit Ko 24)

F. Cited Document 6: Publication of Unexamined Patent Application No. 1996-39936 (Exhibit Ko 79)

G. Cited Document 7: Publication of Unexamined Patent Application No. 1996-332798 (Exhibit Ko 80)

H. Cited Document 8: Microfilm in which the description and drawings attached to Utility Model Application No. 1991-48815 (Publication of Unexamined Utility Model Application No. 1992-132991) are recorded (Exhibit Ko 81)

(2) The JPO identified Cited Invention 1 as follows:

A writing implement structured to be capable of writing any thermochromic images, which is filled with a reversible thermochromic ink composition wherein reversible thermochromic microencapsulated pigment with the point of discoloration on the lower-temperature side within the range between 5°C and 25°C, the point of discoloration on the higher-temperature side within the range between 27°C and 45°C, and the average particle size within the range between 1 and 3 μm is dispersed in an aqueous medium, and which is a color-holding type wherein the colored state in a temperature range not higher than the point of discoloration on the lower-temperature side or the decolored state in a temperature range not lower than the point of discoloration on the higher-temperature side can be held within a specific temperature range.

(3) The JPO found that Invention 1 and Cited Invention 1 have the following common features and differences.

A. Common features between Invention 1 and Cited Invention 1

Both of them are a friction heat-based thermochromic writing implement which is filled with reversible thermochromic ink comprising reversible thermochromic microencapsulated pigment dispersed in an aqueous medium, and which is characterized by producing a thermochromic handwriting that changes, by heat, from the first state at any temperature not higher than the point of discoloration on the higher-temperature side to the second state, and then tautomerically changes to the first state as a result of a drop in temperature from the second state, wherein: tautomeric [note in this judgment: the term "互換性" (compatible) may be a clear clerical error] changes can be made between the first colored state and the second colorless state; and the reversible thermochromic microencapsulated pigment is a color-holding type that can tautomerically hold the colored state or decolored state within a specific temperature range.

B. Differences between Invention 1 and Cited Invention 1

(A) Difference 1

While the reversible thermochromic microencapsulated pigment of Invention 1 has the point of discoloration on the lower-temperature side within the range between -30°C and +10°C and the point of discoloration on the higher-temperature side within the range between 36°C and 65°C, the reversible thermochromic microencapsulated pigment of Cited Invention 1 has the point of discoloration on the lower-temperature side within the range between 5°C and 25°C

and the point of discoloration on the higher-temperature side within the range between 27°C and 45°C.

(B) Difference 2

While the reversible thermochromic microencapsulated pigment of Invention 1 has the average particle size within the range between 0.5 and 5 μm, the reversible thermochromic microencapsulated pigment of Cited Invention 1 has the average particle size within the range between 1 and 3 μm.

(C) Difference 3

While in the case of Invention 1, the "heat" used for the thermochromic writing implement is specified as "friction heat," there is no such specification for Cited Invention 1.

(D) Difference 4

While in the case of Invention 1, the handwriting with the ink when written is in the first state at a room temperature (25°C), there is no such specification for Cited Invention 1.

(E) Difference 5

While in the case of Invention 1, a friction body selected from between elastomer and plastic foam and designed to decolor the handwriting with the ink by friction heat is put on the bottom of the writing implement or the top of its cap, there is no such specification for Cited Invention 1.

4. Grounds for rescission

Errors in the JPO's determination on whether or not a person ordinarily skilled in the art could have easily conceived of the Invention; specifically:

(1) Errors in the finding of Difference 4 and the determination on whether or not a person ordinarily skilled in the art could have easily conceived of Invention 1 regarding Difference 4

(2) Errors in the determination on whether or not a person ordinarily skilled in the art could have easily conceived of Invention 1 regarding Difference 1

(3) Errors in the determination on whether or not a person ordinarily skilled in the art could have easily conceived of Invention 1 regarding Difference 3

(4) Errors in the determination on whether or not a person ordinarily skilled in the art could have easily conceived of Invention 1 regarding Difference 5

(omitted)

No. 4 Court decision

1. The Invention

The claims of the Invention are as described in Section No. 2, 2. According to the Description (Exhibit Ko 94), the Invention has the following features (for the drawing cited below, refer to Attachment 1).

(1) Technical field

The Invention relates to a friction heat-based thermochromic writing implement which produces a handwriting that changes, by friction heat, from the first state to the second state, and then tautomerically changes to the first state as a result of a temperature change ([0001]).

(2) Background art

The conventional types of writing implements with which handwriting that is removable by rubber erasers include pencils and mechanical pencils that use solid lead, and ball-point pens that produce handwriting by adhering coloring ingredients onto the paper material with a low degree of adhesive power ([0002]).

(3) Problem to be solved by the invention

The types of handwriting produced by the conventional types of writing implements mentioned in (2) above are convenient in that they can be removed by rubbing with rubber erasers if they are unnecessary, but once erased, they are no longer visible.

The Invention is designed to provide a convenient friction heat-based thermochromic writing implement that can produce effective thermochromic handwriting for such purposes as learning or training tools, tools for leaving messages, toys and magic equipment, or as tools for causing PIN numbers and confidential documents to appear and disappear, by rubbing the handwriting with a friction body to change it from the first state to the second state, and then restoring it to the first state as a result of a drop in temperature ([0003]).

(4) Means to solve the problem

A. In order to solve the problem mentioned in (3) above, the Invention provides a friction heat-based thermochromic writing implement described in Claims 1, 5 to 7, and 9 ([0004]).

B. The Invention

(A) By using the friction heat produced by the friction body, the Invention can easily change the color from the first state to the second state, thereby tautomerically making the color that is different from the color in a normal state visible. In addition, by setting the point of discoloration on the lower-temperature side within the range between -30°C and +10°C and the point of discoloration on the higher-temperature side within the range between 36°C and 65°C,

the Invention can effectively hold the color that a handwriting takes on in a normal state (within the temperature range of ordinary living).

As reversible thermochromic microencapsulated pigment, a color-holding thermochromic composition, disclosed in Cited Document 6, etc., can be applied. This composition shows great hysteresis characteristics (ΔH_B=8°C to 50°C), that is, it discolors in a manner that the shape of the curve that plots the changes in the color density due to temperature changes greatly differs between the cases where the temperature is increased from the lower-temperature side of the discoloration temperature range and where the temperature is decreased from the higher-temperature side of the discoloration temperature range, and the colored state in the low temperature range not higher than the point of discoloration on the lower-temperature side (complete coloring temperature, t_1) or the decolored state in the high temperature range not lower than the point of discoloration on the higher-temperature side (complete decoloring temperature, t_4) can be held within a specific temperature range (a temperature range between t_2 [coloring commencement temperature] to t_3 [decoloring commencement temperature] (substantially two-phased holding temperature range) (see [Fig. 10]). The substantially two-phased holding temperature range can be set to be suited for purposes. In the Invention, the point of discoloration on the higher-temperature side of the complete decoloring temperature is set within the range between 25°C and 65°C (or preferably between 36°C and 65°C).

The point of discoloration on the lower-temperature side of the complete coloring temperature can be set at any optional temperature within the range between -30°C and +20°C (or preferably between -30°C and +10°C).

By setting the temperatures in this manner, it is possible to tautomerically hold the colored state or decolored state at a temperature between the point of discoloration on the lower-temperature side of the coloring commencement temperature (t_2) and the point of discoloration on the higher-temperature side of the decoloring commencement temperature (t_3) and make the color visible ([0005]).

(B) Reversible thermochromic handwriting produced by writing shows a high density of color because the microcapsules of pigment are thickly aligned with their major axis side (maximum outer diameter side) closely attached to the surface to be written on. When any external force is applied to such handwriting by rubbing a friction body such as an elastomer molded body, the microcapsules of pigment are elastically deformed slightly into a shape that can mitigate the external force, preventing the damage to the wall films of the microcapsules and allowing the color to effectively appear without impairing their thermochromic function ([0006]).

Microencapsulated pigment less easily flows out of capillary gaps if the average maximum outer diameter exceeds 5.0 μm, whereas it is less likely to show a high density of color if the average maximum outer diameter is 0.5 μm or smaller. Preferably, the average maximum outer diameter should be within the range between 1 and 4 μm and the average particle size of the microcapsule ([maximum outer diameter + minimum outer diameter of the center part]/2) should be within the range between 1 and 3 μm ([0007]).

(C) An effective kind of reversible thermochromic ink is one wherein reversible thermochromic microencapsulated pigment with the point of discoloration on the higher-temperature side of the complete decoloring temperature within the range between 25 and 65°C and the average particle size within the range between 0.5 and 5 μm is dispersed in an aqueous medium, which may be mixed with a binder resin if necessary ([0010]).

(D) As a friction body, an elastic body selected from between elastomer and plastic foam in any form is more elastic and easier to use.

For practical use, the friction body is put on the top of the cap or the bottom of the penholder of the writing implement ([0017]).

C. Invention 5

If the first state is black, the writing implement of Invention 5 is merchantable because general handwriting produced by ordinary writing implements is black ([0005]).

D. Inventions 6 and 7

More specifically, effective kinds of reversible thermochromic ink are shear thinning ink containing a shear thinning substance and aggregate-type ink comprising reversible thermochromic microencapsulated pigment suspended and loosely aggregated by means of a water-soluble polymer coagulant ([0010]).

When using shear thinning ink, a ball-point pen-type thermochromic writing implement can be made by injecting the ink into the penholder having a chip that holds a ball rotatably put onto its top and providing a viscous follower (liquid plug) on its bottom.

Aggregate-type ink can be used to make a marker-type thermochromic writing implement wherein: a processed fiber body made by arranging a number of fibers closely and providing capillary gaps between adjoining fibers is used as a pen body; a bundle of fibers with capillary gaps provided between adjoining fibers is used as an ink absorber; the bottom end of the pen body is connected with the top end of the ink absorber; and the ink absorber is impregnated with the aggregate-type ink ([0016]).

E. Invention 9

An effective kind of reversible thermochromic microencapsulated pigment is one that encapsulates a reversible thermochromic composition containing, at least, three essential ingredients, which have been publicly known, namely, (a) an electron-donating color-showing organic compound, (b) an electron-accepting compound, and (c) a reaction medium that determines the temperature at which color reaction between (a) and (b) takes place ([0005]).

As for microcapsules of microencapsulated pigment, those with a circular cross section are not excluded, but those with a non-circular cross section are more effective.

In the case of microcapsules of pigment with a non-circular cross section, the ratio of the reversible thermochromic composition to the wall film must be within the range between 7/1 and 1/1 (by weight) ([0006]).

If the ratio of the reversible thermochromic composition to the wall film exceeds the abovementioned range, the wall film becomes too thin and loses resistance to pressure or heat. Conversely, if the ratio of the wall film to the reversible thermochromic composition exceeds the abovementioned range, the reduction in the color density and clearness upon color development cannot be avoided. Preferably, the ratio of the reversible thermochromic composition to the wall film should be within the range of 6/1 and 1/1 (by weight) ([0007]).

(5) Effect of the invention

The friction heat-based thermochromic writing implement of the Invention can produce any kinds of thermochromic handwriting as desired, and what is more, by using friction heat produced by a simple means of causing friction, it can make tautomeric changes in color between the colored state and the colorless state visible for any part of the handwriting. It is convenient and safe, can be offered for practical use by infants, etc., and can be used for such purposes as learning or training tools, magic equipment, etc.

As a means of causing friction, a friction body selected from between elastomer and plastic foam is put on the bottom of the writing implement or the top of its cap, offering convenience.

The type of this writing implement containing a reversible thermochromic composition with hysteresis width of 8°C or over can maintain the appearance of handwriting after the discoloration even when the friction heat required for the discoloration decreases and the state returns to normal, and can tautomerically hold the appearance of handwriting before the discoloration, by cooling ([0033]).

2. Cited Invention 1

(1) Finding of Cited Invention 1

There are no disputes between the parties with regard to the fact that Cited Document 1 (Exhibit Ko 2) describes Cited Invention 1 (mentioned in Section No.2, 3(2) above), as found by the JPO.

Cited Document 1 discloses Cited Invention 1 as follows (for the drawings cited below, refer to Attachment 2).

A. Technical field

Cited Invention 1 relates to a writing implement using a reversible thermochromic water-based ink composition ([0001]).

B. Background art

Conventionally, when ink comprising thermochromic pigment dispersed in a low-viscosity aqueous medium is used for a writing implement having capillary gaps, problems occurred such as that the sedimentation and separation of the thermochromic pigment occur in the capillary gaps, causing considerable difference in handwriting in terms of color density depending on how the writing implement has been left (with its pen body upward or downward), or causing clogging in the pen body which prevents the flow of ink. In order to solve these problems, it has been proposed to use a reversible thermochromic ink composition wherein reversible thermochromic microencapsulated pigment is suspended and loosely aggregated by means of the loose cross-linking effect of water-soluble polymer coagulant ([0002]).

C. Problem to be solved by the invention

The problem to be solved by Cited Invention 1 is to provide a convenient and practical writing implement using ink that flows out of the pen body with capillary gaps more easily and that comprises a reversible thermochromic ink composition capable of producing durable and thick handwriting ([0003]).

D. Means to solve the problem

(A) Cited Invention 1 is a writing implement which is filled with a reversible thermochromic ink composition comprising reversible thermochromic microencapsulated pigment, water-soluble polymer coagulant, and water as its essential ingredients, wherein the reversible thermochromic microencapsulated pigment is suspended and loosely aggregated by means of the loose cross-linking effect of water-soluble polymer coagulant. A reversible thermochromic ink composition is a color-holding type that can tautomerically hold the colored state or decolored state within a specific temperature range, which is characterized in that each state at a point not higher than the point of discoloration on the lower-temperature side or a point not lower than the point of discoloration on the higher-temperature side can be tautomerically held

within a temperature range between the point of discoloration on the lower-temperature side and the point of discoloration on the higher-temperature side ([0004]).

An effective kind of reversible thermochromic microencapsulated pigment is one that encapsulates a reversible thermochromic composition containing three essential ingredients, namely, (a) an electron-donating color-showing organic compound, (b) an electron-accepting compound, and (c) a reaction medium that determines the temperature at which color reaction between (a) and (b) takes place.

As reversible thermochromic microencapsulated pigment, a color-holding thermochromic composition, disclosed in Cited Document 6, etc., can be applied. This composition shows great hysteresis characteristics (ΔH_B=8°C to 50°C), that is, it discolors in a manner that the shape of the curve that plots the changes in the color density due to temperature changes greatly differs between the cases where the temperature is increased from the lower-temperature side of the discoloration temperature range and where the temperature is decreased from the higher-temperature side of the discoloration temperature range, and the colored state in the low temperature range not higher than the point of discoloration on the lower temperature side (complete coloring temperature, t_1) or the decolored state in the high temperature range not lower than the point of discoloration on the higher temperature side (complete decoloring temperature, t_4) can be held within a specific temperature range (a temperature range between t_2 [coloring commencement temperature] to t_3 [decoloring commencement temperature] (substantially two-phased holding temperature range) (see [Fig. 8]). While the substantially two-phased holding temperature range can be set to be suited for purposes, it generally includes a normal temperature range (e.g. 15°C to 35°C). By setting the point of discoloration on the lower-temperature side (t_1) as a temperature selected from within the range between 5°C and 25°C, and the point of discoloration on the higher-temperature side (t_4) [note in this judgment: "t_2" may be a clear clerical error] as a temperature selected from within the range between 27°C and 45°C respectively, the colored state or decolored state can be held tautomerically and made visible at a temperature between the point of discoloration on the lower-temperature side and the point of discoloration on the higher-temperature side ([0005]).

(B) Thermochromic images produced by writing show a high density of color because the microcapsules of reversible thermochromic microencapsulated pigment that have a non-circular cross section with a concave are thickly aligned with their major axis side (maximum outer diameter side) closely attached to the surface to be written on. When any external force is applied to such thermochromic images by friction or rubbing in order to discolor them by

heating, the microcapsules of pigment are elastically deformed slightly into a shape that can mitigate the external force, preventing the damage to the wall films of the microcapsules and allowing the color to effectively appear without impairing their thermochromic function.

The average particle size ([maximum outer diameter + minimum outer diameter of the center part]/2) of the microcapsule of reversible thermochromic microencapsulated pigment should be within the range between 1 and 3 μm ([0006]).

(C) A writing implement 2 is structured to be capable of writing any thermochromic images, wherein: a processed fiber body made by arranging a number of fibers closely and providing capillary gaps between adjoining fibers is used as a pen body 21; a bundle of fibers with capillary gaps provided between adjoining fibers is used as an ink absorber 22; the bottom end of the pen body 21 is connected with the top end of the ink absorber 22; and the ink absorber 22 is impregnated with the reversible thermochromic water-based ink composition 23 ([0012]; see [Fig. 4])

E. Embodiment of the invention

(A) A reversible thermochromic ink composition in a suspended state is obtained by combining liquid comprising reversible thermochromic microencapsulated pigment containing a reversible thermochromic composition and at least water, in which the microcapsules are dispersed, with a moisturizing agent and other ingredients, and then gradually adding a prescribed amount of polymer coagulant aqueous solution of a prescribed concentration separately prepared, so that the particles of the reversible thermochromic microencapsulated pigment are cross-linked by the polymer coagulant in an aqueous medium in an aggregate state. The ink absorber consisting of a bundle of fibers is impregnated with the reversible thermochromic ink composition and inserted into the penholder equipped with a processed fiber body as the pen body, thus making a writing implement for practical use ([0013]).

(B) Example 3

A reversible thermochromic ink composition was obtained by using reversible thermochromic microencapsulated pigment that is obtained by centrifuging the liquid concentrate of reversible thermochromic microencapsulated pigment containing a reversible thermochromic composition. As in the case of Example 1, a writing implement was made by: impregnating the ink absorber (with the porosity of about 80%), which is coated by synthetic resin film containing polyester sliver, with the reversible thermochromic ink composition immediately after agitating it to make its state uniform; inserting the ink absorber into the penholder; and connecting the ink absorber with a processed resin pen body made of polyester

fiber (with the porosity of about 50%) which is mounted on the top of the penholder. The handwriting produced by this writing implement is colorless (decolored state) at a room temperature (25°C), and then colored in orange when cooled down to about 15°C (t_1) or a lower temperature. This colored state can be held even when the handwriting is heated to a room temperature (25°C) again. When the handwriting colored in orange is further heated, it is decolored at about 32°C (t_4). This decolored state can be held until the handwriting is cooled down to about 15°C or a lower temperature again. Thus, the handwriting in this example showed the color-holding thermochromicity ([Fig. 8]). The decolored state and the colored state were tautomeric within the normal temperature range and reversible ([0015], [0017]).

F. Effect of the invention

The reversible thermochromic ink composition of Cited Invention 1 is characterized in that: reversible thermochromic microencapsulated pigment is suspended and loosely aggregated in liquid by the cross-linking effect of a water-soluble polymer coagulant in a manner that the suspension is maintained stably, without being damaged, in the component with capillary gaps; and the liquid in such state can be drawn out through the capillary gaps. When this composition is used for a writing implement that has a pen body with capillary gaps and an ink absorber, it can flow out properly, without being affected by the condition in which the writing implement has been left, and produce homogenous and clear thermochromic images in which reversible thermochromic microencapsulated pigment is dispersed evenly.

The microcapsules of the reversible thermochromic microencapsulated pigment have a non-circular cross section with a concave, and pass through the capillary gaps in the pen body in a manner that their maximum outer diameter side (major axis side) is aligned to a considerable degree in the axis direction toward the top of the writing implement. This enables smooth writing, without causing the failure of ink flow, and produces clear and thick thermochromic images with the major axis side of the microcapsules being aligned and closely attached to the paper surface. Furthermore, when thermochromic images are heated by rubbing or causing friction discolored, the wall films of the microcapsules show resistance against the damage caused by this kind of external force.

The type of the reversible thermochromic microencapsulated pigment containing a reversible thermochromic composition with hysteresis width of 8°C or over can tautomerically maintain the colors before and after the discoloration even after the heating or cooling performed for the discoloration is stopped, thereby producing any thermochromic images such as letters, numerals, signs, patterns, messages, whatsoever. Thus, it can be used for various

purposes, including a temperature sensor, painting materials, learning tools (for memorizing or underlining terms), recording tools (for confidential documents or PIN numbers), and so forth ([0022]).

(2) Comparison between Invention 1 and Cited Invention 1

It is found that Invention 1 and Cited Invention 1 have, at least, Differences 1 to 3 and 5 as found by the JPO (those mentioned in Section No. 2, 3(3)B(A) to (C) and (E) above). The parties agree this point.

3. Errors in the finding of Difference 4 and the determination on whether or not a person ordinarily skilled in the art could have easily conceived of Invention 1 regarding Difference 4

(1) Finding of Difference 4

A. As mentioned in Section No. 2, 3(3)B(D) above, the JPO found Difference 4 between Invention 1 and Cited Invention 1 in that, while in the case of Invention 1, the handwriting with the ink when written is in the first state (colored state) at a room temperature (25℃), there is no such specification for Cited Invention 1.

(2) As mentioned in 2(1) above, Cited Invention 1 relates to a writing implement structured to be capable of writing any thermochromic images, which is filled with a reversible thermochromic ink composition wherein reversible thermochromic microencapsulated pigment with the point of discoloration on the lower-temperature side within the range between 5°C and 25°C, the point of discoloration on the higher-temperature side within the range between 27°C and 45°C, and the average particle size within the range between 1 and 3 μm is dispersed in an aqueous medium, and which is a color-holding type wherein the colored state in a temperature range not higher than the point of discoloration on the lower temperature side or the decolored state in a temperature range not lower than the point of discoloration on the higher temperature side can be held within a specific temperature range. According to the statement in Cited Document 1, the reversible thermochromic microencapsulated pigment is a color-holding type that can tautomerically hold the colored state or decolored state within a specific temperature range ([0004]).

Cited Document 1 discloses the color-holding reversible thermochromic microencapsulated pigment as follows: [i] it is characterized in that each state at a point not higher than the point of discoloration on the lower-temperature side or a point not lower than the point of discoloration on the higher-temperature side can be tautomerically held within a temperature range between the point of discoloration on the lower-temperature side and the point of discoloration on the higher-temperature side ([0004]); [ii] as shown in [Fig. 8], it shows great hysteresis

characteristics (ΔH_B=8°C to 50°C), that is, it discolors in a manner that the shape of the curve that plots the changes in the color density due to temperature changes greatly differs between the cases where the temperature is increased from the lower-temperature side of the discoloration temperature range and where the temperature is decreased from the higher-temperature side of the discoloration temperature range, and the colored state in the low temperature range not higher than the point of discoloration on the lower temperature side (complete coloring temperature, t_1) or the decolored state in the high temperature range not lower than the point of discoloration on the higher temperature side (complete decoloring temperature, t_4) can be held within a specific temperature range (a temperature range between t_2 [coloring commencement temperature] to t_3 [decoloring commencement temperature] (substantially two-phased holding temperature range) ([0005]); and [iii] while the substantially two-phased holding temperature range can be set to be suited for purposes, it generally includes a normal temperature range (e.g. 15°C to 35°C) ([0005]).

According to these statements, it is found that Cited Document 1 discloses that Cited Invention 1, which relates to a color-holding writing implement, sets the normal temperature range (e.g. 15°C to 35°C) as the substantially two-phased holding temperature range by taking advantage of the significant hysteresis width of a color-holding reversible thermochromic microencapsulated pigment, and that, within this temperature range, it can achieve both of the following conditions: [i] the handwriting when written is in the colorless state, or the decolored state, which appears in the high temperature range not lower than the point of discoloration on the higher-temperature side (complete decoloring temperature, t_4), and this state can be held unless the temperature decreases to the coloring commencement temperature (t_2) or lower; and [ii] the handwriting when written is in the colored state, which appears in the low temperature range not higher than the point of discoloration on the lower-temperature side (complete coloring temperature, t_1), and this state can be held unless the temperature increases to the decoloring commencement temperature (t_3) or higher.

Among the examples disclosed in Cited Document 1, Example 3 is the only one that relates to a color-holding writing implement. The handwriting produced by the writing implement in Example 3 is colorless (decolored state) at a room temperature (25°C), and then colored in orange when cooled down to about 15°C (t_1) or a lower temperature. This colored state can be held even when the handwriting is heated to a room temperature (25°C) again. When the handwriting colored in orange is further heated, it is decolored at about 32°C (t_4). This decolored state can be held until the handwriting is cooled down to about 15°C or a lower

temperature again ([0017]). Thus, Example 3 corresponds to the condition [i] above, wherein the handwriting when written is in the colorless state, or the decolored state, which appears in the high temperature range not lower than the point of discoloration on the higher-temperature side (complete decoloring temperature, t_4), and this state can be held unless the temperature decreases to the coloring commencement temperature (t_2) or lower. However, Cited Document 1 discloses Example 3, which corresponds to the condition [i] above, as one example of a color-holding writing implement, and it cannot be understood as excluding the condition [ii] above, wherein the handwriting when written is in the colored state, which appears in the low temperature range not higher than the point of discoloration on the lower-temperature side (complete coloring temperature, t_1), and this state can be held unless the temperature increases to the decoloring commencement temperature (t_3) or higher.

Consequently, Cited Invention 1 should be interpreted as including both types of writing implement for which the handwriting with ink when written is in the colored state or colorless state at a room temperature (25°C) within the normal temperature range, and it should not be limited to either of these types. Hence, it can be said that in the case of Cited Invention 1, the handwriting with ink when written at a room temperature (25°C) is not specified as either colored or colorless.

On the other hand, in the case of Invention 1, the "first state is colored" and the "handwriting with the ink when written is in the first state at a room temperature (25°C)."

Consequently, it is found that there is a difference between Invention 1 and Cited Invention 1 in that, while in the case of Invention 1, the handwriting with the ink when written is in the first state at a room temperature (25°C), there is no such specification for Cited Invention 1 (the same as Difference 4 as found by the JPO).

C. Plaintiffs' allegation

(A) The plaintiffs allege that the JPO made a finding of Cited Invention 1 based on the statement in paragraph [0017] of Cited Document 1, and that according to the statement of this paragraph, it is obvious that the handwriting with ink when written with the writing implement of Cited Invention 1 is in the colorless state at a room temperature (25°C).

(B) It is true that, as mentioned in B. above, among the examples disclosed in Cited Document 1, Example 3 described in paragraph [0017] is the only one that relates to a color-holding writing implement, and that the handwriting written with the writing implement in Example 3 is in the colorless state at a room temperature (25°C).

However, when making a finding of Cited Invention 1, the JPO relied on the statements in paragraphs [0004], [0005], [Fig. 8], etc. of Cited Document 1 in addition to paragraph [0017] of the same. As mentioned above, according to these statements, Cited Document 1 discloses that Cited Invention 1 sets the normal temperature range (e.g. 15°C to 35°C) as the substantially two-phased holding temperature range, and that, within this temperature range, it can achieve both of the following conditions: [i] the handwriting when written is in the colorless state, or the decolored state, which appears in the high temperature range not lower than the point of discoloration on the higher-temperature side (complete decoloring temperature, t_4), until the temperature decreases to the coloring commencement temperature (t_2) or lower; and [ii] the handwriting when written is in the colored state, which appears in the low temperature range not higher than the point of discoloration on the lower-temperature side (complete coloring temperature, t_1), until the temperature increases to the decoloring commencement temperature (t_3) or higher. Cited Document 1 discloses the condition [i] above (the handwriting when written is in the colorless state at a room temperature) only as one example, and it cannot be understood as excluding the condition [ii] above (the handwriting when written is in the colored state at a room temperature).

D. Summary

For these reasons, there is no error in the JPO's finding of Difference 4.

(2) Errors in the determination on whether or not a person ordinarily skilled in the art could have easily conceived of Invention 1 regarding Difference 4

A. As mentioned in (1)B. above, Cited Invention 1 can be interpreted as including both types of writing implement for which the handwriting with ink when written is in the colored state or colorless state at a room temperature (25°C) within the normal temperature range.

Consequently, Difference 4 cannot be regarded as a substantial difference.

B. Plaintiffs' allegation

The plaintiffs allege that with regard to the state of the handwriting written with a writing implement filled with color-holding reversible thermochromic microencapsulated pigment, Cited Document 1 only discloses the use of a writing implement to produce handwriting in the colorless state at a room temperature (25°C), and based on the premise that the handwriting with ink when written with the writing implement of Cited Invention 1 is in the colorless state at a room temperature (25°C), they allege that there is no motivation to adopt the structure of Invention 1 regarding Difference 4. However, as mentioned in (1)B. above, their allegation is based on an erroneous premise.

C. Summary

For these reasons, there is no error in the conclusion of the JPO's determination regarding Difference 4.

4. Errors in the determination on whether or not a person ordinarily skilled in the art could have easily conceived of Invention 1 regarding Difference 1

(1) Difference 1

As mentioned in 2(2) above, there is a difference between Invention 1 and Cited Invention 1 (Difference 1) in that, while the reversible thermochromic microencapsulated pigment of Invention 1 has the point of discoloration on the lower-temperature side within the range between -30°C and +10°C and the point of discoloration on the higher-temperature side within the range between 36°C and 65°C, the reversible thermochromic microencapsulated pigment of Cited Invention 1 has the point of discoloration on the lower-temperature side within the range between 5°C and 25°C and the point of discoloration on the higher-temperature side within the range between 27°C and 45°C.

(2) Point of discoloration on the lower-temperature side and point of discoloration on the higher-temperature side in Invention 1

As mentioned in (1) above, with regard to the point of discoloration on the lower-temperature side (complete coloring temperature, t_1) and point of discoloration on the higher-temperature side (complete decoloring temperature, t_4) in Invention 1, the Description states as follows: "by setting the point of discoloration on the lower-temperature side within the range between -30°C and +10°C and the point of discoloration on the higher-temperature side within the range between 36°C and 65°C, the present invention can effectively hold the color that a handwriting takes on in a normal state (within the temperature range of ordinary living)…The substantially two-phased holding temperature range can be set to be suited for purposes. In the present invention, the point of discoloration on the higher-temperature side of the complete decoloring temperature is set within the range between 25°C and 65°C (or preferably between 36°C and 65°C). The point of discoloration on the lower-temperature side of the complete coloring temperature can be set at any optional temperature within the range between -30°C and +20°C (or preferably between -30°C and +10°C)" ([0005]). According to these statements, both the numerical range of the point of discoloration on the lower-temperature side, i.e. "between -30°C and +10°C," and the numerical range of the point of discoloration on the higher-temperature side, i.e. "between 36°C and 65°C," indicate ranges of

preferable numerical values for making it possible to effectively hold the colors in a normal state (within the temperature range of ordinary living).

(3) Whether or not a person ordinarily skilled in the art could have easily conceived of Invention 1 regarding Difference 1

(A) As mentioned in 2(1) above, Cited Document 1 states that "While the substantially two-phased holding temperature range can be set to be suited for purposes, it generally includes a normal temperature range (e.g. 15°C to 35°C)" ([0005]). A person ordinarily skilled in the art, having accessed this statement, would be motivated to make the range of the point of discoloration on the lower-temperature side lower than the range adopted in Cited Invention 1, i.e. between "5°C and 25°C," and make the range of the point of discoloration on the higher-temperature side higher than the range adopted in Cited Invention 1, i.e. between "27°C and 45°C," so that the substantially two-phased holding temperature range would cover a broader normal temperature range.

B. Cited Document 6 (Exhibit Ko 79)

(A) Cited Document 6 (Exhibit Ko 79) discloses an "invention relating to a temperature sensitive color-holding composition which produces reversible changes between the colored and decolored states by exerting hysteresis characteristics that are greater than temperature changes, and holds either the colored state or decolored state tautomerically and reversibly within a normal temperature range even after the heating or cooling performed for the discoloration is stopped" ([0001]), by claiming it as follows: "a temperature sensitive color-holding composition which comprises a homogenous solution containing, as three essential ingredients, (a) an electron-donating color-showing organic compound, (b) an electron-accepting compound, and (c) a compound selected from among arylalkyl ketones C12 to 24 that controls the color reactions of (a) and (b), and which discolors while showing the hysteresis width (ΔH) between 8°C and 80°C in terms of the color density-temperature curve" (Claim 1). Cited Document 6 states as summarized below (for the drawing cited below, refer to Attachment 3).

More specifically, Cited Document 6 states as follows: "In [Fig. 1], the vertical axis shows the color density and the horizontal axis shows the temperature, and the changes in color density caused by temperature changes progress along the arrow. In this figure: A is the point indicating the density at the minimum temperature where the completely decolored state is achieved (complete decoloring temperature, T_4); B is the point indicating the density at the maximum temperature where the completely colored state can be held (maximum holding temperature, T_3); C is the point indicating the density at the minimum temperature where the completely

decolored state can be held (minimum holding temperature, T_2); and D is the point indicating the density where the completely colored state is achieved (complete coloring temperature, T_1). At temperature T_A, two phases, i.e. the colored state point E and the decolored state point F, coexist. The temperature range where the colored state and the decolored state can coexist, including temperature T_A, is the temperature range where the color after the discoloration can be held, and the length of the line H-G that passes through the center of the line E-F is the temperature width that indicates the degree of hysteresis (hysteresis width, ΔH). As the ΔH value becomes larger, it is easier to hold the states before and after the discoloration. The tests conducted by the inventors show that the ΔH value at which the states before and after the discoloration can be practically held is within the range between 8°C and 80°C. The effective temperature range at which both the colored state and the decolored state can be substantially held and practically used, or in other words, the temperature range between T_2 and T_3, including T_A, is the range of 2°C or higher and 80°C or lower" ([0005]).

The term "temperature sensitive color-holding composition" as used in these statements is interpreted as including a color-holding reversible thermochromic microencapsulated pigment in Cited Invention 1.

(B) As mentioned in A. above, a person ordinarily skilled in the art, who is motivated to make the range of the point of discoloration on the lower-temperature side lower than the range adopted in Cited Invention 1, i.e. between "5°C and 25°C," and make the range of the point of discoloration on the higher-temperature side higher than the range adopted in Cited Invention 1, i.e. between "27°C and 45°C," so that the substantially two-phased holding temperature range would cover a broader normal temperature range, when accessing the statements in Cited Document 6 mentioned in (A) above, would attempt to broaden the substantially two-phased holding temperature range to the extent not higher than 80°C, which is the limit of the effective range, and also attempt to broaden the hysteresis width to the extent of 80°C or lower, which is the limit at which the states before and after the discoloration can practically be held, so as to make it easier to hold the states before and after the discoloration.

Cited Document 6 specifically describes the ingredients of "homogenous solution containing, as three essential ingredients, (a) an electron-donating color-showing organic compound, (b) an electron-accepting compound, and (c) a compound selected from among arylalkyl ketones C12 to 24 that controls the color reactions of (a) and (b)," which is necessary in order to obtain a "temperature sensitive color-holding composition which discolors while showing the hysteresis width (ΔH) between 8°C and 80°C," and their respective percentages ([0007] to [0011]).

Furthermore, it states that this solution can be microencapsulated, and that the ΔH value can be increased by making the particular size very small (0.5 to 50 μm, or preferably, 1 to 30μm) ([0012]). In Examples 11 to 13, 20, and 21, both the complete coloring temperature T_1, which corresponds to the point of discoloration on the lower-temperature side, and the complete decoloring temperature T_4, which corresponds to the point of discoloration on the higher-temperature side, are within the range specified by Invention 1 ([0015] to [0023], [Fig. 1] to [Fig. 3]).

C. Whether or not a person ordinarily skilled in the art could have easily conceived of Invention 1 regarding Difference 1

In light of the above, a person ordinarily skilled in the art would be motivated to make the range of the point of discoloration on the lower-temperature side lower than the range adopted in Cited Invention 1, i.e. between "5°C and 25°C," and make the range of the point of discoloration on the higher-temperature side higher than the range adopted in Cited Invention 1, i.e. between "27°C and 45°C," so that the substantially two-phased holding temperature range would cover a broader normal temperature range, and upon accessing Cited Document 6, such person would attempt to broaden the width of the substantially two-phased holding temperature range to the extent not higher than 80°C and the hysteresis width to the extent of 80°C or lower by determining the ingredients, percentages of ingredients, and particular size of a compound that constitutes a color-holding reversible thermochromic microencapsulated pigment, which is a temperature sensitive color-holding composition, and by doing so, the person could have identified the range between the point of discoloration on the lower-temperature side and the point of discoloration on the higher-temperature side which are preferable for making it possible to effectively hold the colors in a normal state (within the temperature range of ordinary living), and thus easily conceived of the structure of Invention 1 regarding Difference 1.

(4) Plaintiffs' allegation

A. The plaintiffs allege that Cited Invention 1 is designed for coloring by cooling and it differs from Invention 1 in this respect, and therefore that it does not provide any motivation to set a higher point of discoloration on the higher-temperature side within the range between 36°C and 65°C in order to prevent the unintentional decoloring of handwriting.

However, as mentioned in 3(1) above, Cited Invention 1 is intended to achieve not only the condition [i] wherein the handwriting when written is in the colorless state (decolored state) and this state can be held unless the temperature decreases to the coloring commencement temperature (t_2) or lower, or in other words, the handwriting is colored when the temperature

declines below t_2, but also the condition [ii] wherein the handwriting when written is in the colored state and this state can be held unless the temperature increases to the decoloring commencement temperature (t_3) or higher, or in other words, the handwriting is decolored when the temperature rises above t_3. Therefore, the plaintiffs' allegation is based on an erroneous premise.

B. The plaintiffs allege as follows: until Invention 1 became known, there had been no knowledge of the fact that a sufficient temperature rise can be obtained by rubbing a medium such as paper, and setting a higher point of discoloration on the higher-temperature side had been incompatible with the technical idea of causing discoloration by friction heat; therefore, there was a teaching away from setting the point of discoloration on the higher-temperature side in Cited Invention 1 within the temperature range between 36°C and 45°C, which is higher than the point adopted in the example, 32°C, from within the temperature range between 27°C and 45°C stated in Cited Document 1.

However, although Cited Document 1 contains statements that imply the rubbing of a medium such as paper, including "when any external force is applied to such thermochromic images by friction or rubbing in order to discolor them by heating" ([0006]), these statements cannot be understood as limiting the heating means to those mentioned therein. In fact, paragraph [0002] of Cited Document 2 (Exhibit Ko 3) describes, as a means of heating thermochromic images, the device with a motor and power source installed therein, which generates friction heat by causing rotary friction between the component that is linked with the rotary shaft of the motor and the contact part of the thermochromic layer. Therefore, even if, as of the priority date in question, there had been no knowledge of the fact that a sufficient temperature rise can be obtained by rubbing a medium such as paper, since the heating means stated in Cited Document 1 is not limited to rubbing of a medium such as paper, it cannot be necessarily said that setting a higher point of discoloration on the higher-temperature side would make it difficult to increase the temperature to that point and would therefore make it difficult to cause discoloration by heat as well.

Furthermore, Cited Document 1 states that the substantially two-phased holding temperature range generally includes a normal temperature range (e.g. 15°C to 35°C) ([0005]). Therefore, it would have been sufficiently possible for a person ordinarily skilled in the art to set the point of discoloration, which is the complete decoloring temperature that is higher than the decoloring commencement temperature within the substantially two-phased holding temperature range, at a

temperature not lower than 36°C, and hence it cannot be said that there was a teaching away from adopting this temperature.

(5) Summary

For these reasons, there is no error in the JPO's determination that a person ordinarily skilled in the art could have easily conceived of the structure of Invention 1 regarding Difference 1.

5. Errors in the determination on whether or not a person ordinarily skilled in the art could have easily conceived of Invention 1 regarding Difference 3

(1) As mentioned in 2(2) above, there is a difference between Invention 1 and Cited Invention 1 (Difference 3) in that, while in the case of Invention 1, the "heat" used for the thermochromic writing implement is specified as "friction heat," there is no such specification for Cited Invention 1.

There may be various methods for heating. With regard to the means to solve the problem, Cited Document 1 states as follows: "When any external force is applied to such thermochromic images by friction or rubbing in order to discolor them by heating, the microcapsules of pigment are elastically deformed slightly into a shape that can mitigate the external force, …allowing the color to effectively appear without impairing their thermochromic function" ([0006]). As the effect of the invention, it also states that "when thermochromic images are heated by rubbing or causing friction and discolored, the wall films of the microcapsules show resistance against the damage caused by this kind of external force" ([0022]).

Upon accessing these statements, a person ordinarily skilled in the art could have selected friction heat as a means of heating to decolor the colored handwriting written by the writing implement of Cited Invention 1, and thereby arrived at the structure of Invention 1 regarding Difference 3.

(2) Plaintiffs' allegation

A. The plaintiffs allege that the JPO made a finding of Cited Invention 1 based on paragraph [0017] of Cited Document 1, and that although it is clear that a means of heating that enables the measurement of the temperature of about 32°C as stated in this paragraph has been adopted, this adopted means cannot be friction heat.

However, as mentioned in 3(1)C. above, the JPO did not make a finding of Cited Invention 1 only based on paragraph [0017] of Cited Document 1, and thus the plaintiffs' allegation is based on an erroneous premise.

B. The plaintiffs allege that since the thermochromic writing implement of Cited Invention 1 is a writing implement which produces a handwriting that is colorless when written but becomes

colored by cooling, and therefore that what should be discussed in relation to the means of changing the temperature is a cooling means used to make the handwriting colored, and there is little necessity to discuss the heating means.

However, as mentioned in 4(4)A. above, Cited Invention 1 is intended to also achieve the condition wherein the handwriting when written is in the colored state and this state can be held unless the temperature increases to the decoloring commencement temperature (t_3) or higher, or in other words, the handwriting is decolored when the temperature rises above t_3, and hence, the plaintiffs' allegation is based on an erroneous premise.

C. The plaintiffs allege that Cited Document 1 does not disclose at all, or even suggest, a "friction body," which is integrated with the writing implement as a tool that is exclusively intended to "decolor the handwriting with the ink by friction heat," unlike the one in Invention 1.

However, the structure regarding the friction body is an issue involving Difference 5 discussed in 6. below, not an issue involving Difference 3.

(3) Summary

For these reasons, there is no error in the JPO's determination that a person ordinarily skilled in the art could have easily conceived of the structure of Invention 1 regarding Difference 3.

6. Errors in the determination on whether or not a person ordinarily skilled in the art could have easily conceived of Invention 1 regarding Difference 5

(1) As mentioned in 2(2) above, there is a difference between Invention 1 and Cited Invention 1 (Difference 5) in that, while in the case of Invention 1, a friction body selected from between elastomer and plastic foam and designed to decolor the handwriting with the ink by friction heat is put on the bottom of the writing implement or the top of its cap, there is no such specification for Cited Invention 1.

(2) Whether or not a person ordinarily skilled in the art could have easily conceived of Invention 1 regarding Difference 5

A. The JPO determined as follows: a person ordinarily skilled in the art could have easily conceived of combining Cited Invention 1 with Cited Invention 2, which fall within the common technical field (writing implement) and have also in common the art of decoloring thermochromic handwriting by heating with the friction heat generated by the friction body; as the material for the friction body, such person could have selected either elastomer or plastic foam stated in Cited Document 2 as necessary, and putting the friction body thus selected on the bottom of the writing implement or the top of its cap is a well-known or commonly used

structure disclosed in Cited Documents 3, 4, 7 and 8; hence, a person ordinarily skilled in the art could have easily conceived of the structure of Invention 1 regarding Difference 5.

B. Cited Invention 1

Cited Document 1 only contains such statements that "when any external force is applied to such thermochromic images by friction or rubbing in order to discolor them by heating" ([0006]) and "when thermochromic images are heated by rubbing or friction and discolored" ([0022]), but it does not state or suggest any specific means to generate friction heat.

C. Cited Invention 2

As found by the JPO, it is found that Cited Document 2 (Exhibit Ko 3) discloses "a set of thermochromic writing tools including the friction tool 9 to be used to decolor the handwriting written with thermochromic ink 10, by the friction heat generated manually (Cited Invention 2).

Cited Document 2 discloses Cited Invention 2 as follows (for the drawing cited below, refer to Attachment 4).

(A) Background art and problem to be solved by the invention

The conventional means of discoloring a thermochromic layer by friction heat include a means of generating friction heat by rubbing the top surface the thermochromic layer by hand, and a means of generating friction heat by a device with a motor and power source installed therein which generates friction heat by causing rotary friction between the component that is linked with the rotary shaft of the motor and the contact part of the thermochromic layer. However, these conventional means have problems such as damaging the thermochromic layer and requiring a complicated and costly device. Therefore, Cited Invention 2 aims to provide [i] a heating and discoloring tool that does not damage the thermochromic layer, has a simple structure, and is less likely to be broken, and [ii] a set of thermochromic writing tools comprising a thermochromic body with a thermochromic layer provided therein ([0002] to [0004]).

(B) Means to solve the problem

a. Cited Invention 2 relates to a set of thermochromic writing tools comprising [i] a thermochromic body with a thermochromic layer provided on the surface of the supporting body, and [ii] a friction tool that discolors the thermochromic layer by the friction heat generated manually.

The thermochromic layer has a point of discoloration within the range between 5°C and 50°C, and it is made of reversible thermochromic materials that are colored at a temperature lower than the point of discoloration and decolored at a temperature higher than the point of

discoloration. The thermochromic layer exerts the hysteresis characteristics by temperature changes, and makes tautomeric changes between the colored state and the colorless state or between the colored state (1) and the colored state (2). It is made of microcapsules of pigment containing pseudo reversible thermochromic materials for which the two-phased holding temperature range wherein both the colored state and the decolored state or both the colored state (1) and the decolored state (2) can coexist is within the normal temperature range, and such microcapsules are dispersed and attached within a binder ([0005], [0010], [0011]).

b. The supporting body can be made with any material that has printability, and paper and plastics are used ([00014]). The pseudo thermochromic materials mentioned in a. above are dispersed in the medium containing the binder and used as coloring agents such as ink and paint, thereby producing a desired thermochromic layer on the surface of the supporting body ([0012]).

c. The friction tool is a tool to erase the colored images on the thermochromic layer by heat ([0005]). The friction tool is a tool to generate friction heat between the friction part and the friction surface of the thermochromic body (thermochromic layer) to discolor the thermochromic layer. Materials that have adequate resistance to friction but have low hardness so that they do not damage the friction surface by causing friction are selected for the friction tool. Preferably, non-metal materials with small friction heat loss should be selected to make the friction tool so that the friction heat generated between the friction surface and the friction part can be conducted to the thermochromic layer effectively ([0006]).

Materials that may be used to make the friction part of the friction tool that can satisfy these requirements include: polystyrol and other foams in the category of thermoplastic or thermosetting resin foams; cellulose acetate in the category of plastic foams; and polybutadiene in the category of elastomer ([0007]).

(C) Function

If the thermochromic layer is decolored in a normal state, a thermochromic image is displayed by using a cooling pen filled with a piece of ice or cold water, which has been publicly known, and then the image is erased by rubbing its surface with the friction tool, and thus the friction tool functions as an eraser. In the case of the type of a thermochromic layer made of pseudo thermochromic materials containing color-holding temperature sensitive coloring matters, the appearance after discoloration can be held tautomerically and made visible within a normal temperature range even after the heating or cooling performed for [the] discoloration is stopped ([0016]).

(D) Example (see [Fig. 1])

A thermochromic body 2 is made by making a thermochromic sheet 4 using thermochromic ink that comprises thermochromic pigment in which color-holding temperature sensitive coloring matters are encapsulated, and making the sheet firmly supported by a plastic main body 3. A grip 5 is provided integrally on the side of the main body 3; and on the right side of the main body 3, [i] a pen stand 6 to hold a cooling pen 8, and [ii] a tray 7 to accommodate the cooling pen 8 when the user carries the thermochromic body 2 upright, are provided ([0017], [0018]).

When the thermochromic body 2 is heated to 30°C or higher and the user writes something with the cooling pen 8 on the writing surface on which the thermochromic sheet 4 is colored in white, the color-holding temperature sensitive coloring matters are colored to produce handwriting 10 in blue, and the handwriting 10 is held at a room temperature of 25°C ([0019]). When the surface of the handwriting 10 is rubbed with the friction tool 9, the handwriting 10 can be erased by the friction heat generated between the writing surface and the friction part. The writing part 4 turns back to white, and the white color is held at a room temperature of 25°C. These changes in the appearance can be repeatedly made by using the cooling pen 8 and the friction tool 9 ([0020]).

D. Idea of combining Cited Invention 1 with Cited Invention 2

As mentioned in 2. above, Cited Invention 1 relates to a writing implement, such as a pen, which is filled with a reversible thermochromic ink composition comprising color-holding reversible thermochromic microencapsulated pigment dispersed in an aqueous medium, and which is a color-holding type wherein the colored state in a temperature range not higher than the point of discoloration on the lower-temperature side or the decolored state in a temperature range not lower than the point of discoloration on the higher-temperature side can be held within a specific temperature range. Handwriting of thermochromic images can be produced on any medium such as paper by using this writing implement itself (Cited Document 1 [0004] to [0006], [0012], [Fig. 4]).

On the other hand, Cited Invention 2 relates to a set of writing tools comprising a writing implement, a supporting body on which a thermochromic layer is formed, and other tools. As mentioned in C. above, it uses, as a coloring agent such as ink, the same kind of color-holding reversible thermochromic microencapsulated pigment dispersed in the medium containing a binder. A thermochromic layer is formed on the surface of the supporting body that is made of paper or plastics, and then by writing something on the thermochromic layer with the cooling

pen which is filled with a piece of ice or cold water and thus cooled to the point of discoloration on the lower-temperature side or a lower temperature, the handwriting of a thermochromic image is produced (Cited Document 2 [0005], [0010] to [0012], [0014], [0016] to [0020], [Fig. 1]). The cooling pen of Cited Invention 2, which is a writing implement, is unique in that it is filled with a piece of ice or cold water and thus cooled to the point of discoloration on the lower-temperature side or a lower temperature, and unlike an ordinary type of writing implement which produces handwriting with ink or lead, the cooling pen alone cannot produce any handwriting of thermochromic image but it can produce handwriting of thermochromic image only when it is used to write something on the thermochromic layer formed on the surface of the supporting body, which forms a set together with it.

Thus, although both Cited Invention 1 and Cited Invention 2 use color-holding reversible thermochromic microencapsulated pigment, they are considerably different in terms of the structure and the function to produce handwriting as follows: [i] while Cited Invention 1 is a writing implement such as a pen which is filled with reversible thermochromic ink composition, and handwriting of thermochromic images can be produced on any medium such as paper by using this writing implement itself, [ii] Cited Invention 2 is a set of writing tools comprising a writing implement, a supporting body on which a thermochromic layer is formed, and other tools, and the cooling pen, which is a writing implement, is unique in that it is filled with a piece of ice or cold water and thus cooled to the point of discoloration on the lower-temperature side or a lower temperature and it does not contain ink or pigment, and unlike an ordinary type of writing implement, the cooling pen alone cannot produce any handwriting of thermochromic image and it can produce handwriting of thermochromic image only when it is used to write something on the thermochromic layer formed on the surface of the supporting body, which forms a set together with it; therefore, when using Cited Invention 2, handwriting can be produced only on the thermochromic layer formed on the surface of the supporting body. Consequently, it is unlikely for a person ordinarily skilled in the art to hit upon an idea of combining Cited Invention 1 with Cited Invention 2.

E. Whether or not a person ordinarily skilled in the art could have easily conceived of Invention 1 regarding Difference 5

(A) As mentioned in D. above, it is unlikely for a person ordinarily skilled in the art to have hit upon an idea of combining Cited Invention 1 with Cited Invention 2, which are considerably different in terms of the structure and the function to produce handwriting, and therefore a

person ordinarily skilled in the art cannot be considered to have easily conceived of the structure of Invention 1 regarding Difference 5.

(B) Even if a person ordinarily skilled in the art combined Cited Invention 1 with Cited Invention 2, since Cited Document 2, as mentioned in C. above, only discloses the friction tool 9 as a part separated from the thermochromic body 2 and cooling pen 8 which are used to produce thermochromic images, the friction tool 9 of Cited Invention 2 is a part separated from the writing implement. Hence, even if a person ordinarily skilled in the art combined these inventions, the person would have conceived of only a structure which is designed to provide the writing implement of Cited Invention 1, and the friction tool 9 equipped with the friction body made of elastomer or plastic foam, which is separated from the writing implement, and could not have arrived at the structure of Invention 1 regarding Difference 5 which is designed to provide the writing implement and the friction body as one unit by putting the friction body on the bottom of the writing implement or the top of its cap.

(C) As mentioned in B. above, Cited Document 1 does not state or suggest any specific means to generate friction heat.

Also as mentioned in C. above, Cited Document 2 only discloses the friction tool 9 as a part separated from the thermochromic body 2 and cooling pen 8 which are used to produce thermochromic images, and it does not state or suggest a problem that may arise from providing the friction tool 9 as such separate part or an idea of providing it as one unit with the thermochromic body 2 and cooling pen 8.

Cited Document 3 (Exhibit Ko 9), Exhibits Ko 10 and 11, Cited Document 4 (Exhibit Ko 12), and Exhibits Ko 13, 14, and 52 disclose the art of putting a rubber eraser or any other erasing tool on the bottom of a writing implement or the top of its cap from the perspective of ensuring multifunctionality and portability of a writing implement; Cited Document 7 (Exhibit Ko 80) discloses the art of providing safety measures for a rubber eraser put on the bottom of a writing implement or the top of its cap to prevent infants, etc. from swallowing the eraser mistakenly; and Cited Document 8 (Exhibit Ko 81) discloses the method of press-fitting an erasing tool such as a rubber eraser and correction liquid to the cap of a writing implement firmly. However, all of these documents disclose nothing more than the idea of putting a tool that simply functions to erase handwriting, such as a rubber eraser, to the bottom of a writing implement or the top of its cap.

On the other hand, the friction tool 9 of Cited Invention 2 is designed to generate friction heat to decolor, by heat, colored handwriting produced with a reversible thermochromic ink

composition comprising color-holding reversible thermochromic microencapsulated pigment which is a color-holding type wherein the colored state in a temperature range not higher than the point of discoloration on the lower-temperature side or the decolored state in a temperature range not lower than the point of discoloration on the higher-temperature side can be held within a specific temperature range, and thus, it is different in nature from a tool that simply functions to erase handwriting. None of Cited Documents 3, 4, 7, and 8, Exhibits Ko 10, 11, 13, 14, and 52 states or suggests this kind of friction tool. Therefore, it cannot be said that the structure wherein such a friction tool is put on the bottom of a writing implement or the top of its cap was well-known among persons ordinarily skilled in the art. Furthermore, it is unlikely for a person ordinarily skilled in the art to be motivated to adopt a structure wherein a tool that simply functions to erase handwriting, which is disclosed in Cited Documents 3, 4, 7, and 8, Exhibits Ko 10, 11, 13, 14, and 52 and which is different in nature from the friction tool 9, to the bottom of a writing implement or the top of its cap, as a means to provide the friction tool 9.

(D) Even if a person ordinarily skilled in the art could have conceived of putting the friction tool 9 to the bottom of a writing implement or the top of its cap, in order to arrive at the structure of Invention 1 regarding Difference 5, the person would need to conceive of providing a "friction body selected from between elastomer and plastic foam and designed to decolor the handwriting with the ink by friction heat" together with the writing implement by combining Cited Invention 1 with Cited Invention 2 as mentioned in D. above, and then, based on this idea, conceive of putting the friction body to the writing implement itself or its cap as a means to provide the friction body (friction tool 9). Thus, considerable efforts would be required to arrive at the structure of Invention 1 regarding Difference 5 through these two steps based on Cited Invention 1, and this cannot be regarded as an easy task for a person ordinarily skilled in the art.

(E) Consequently, it cannot be said that a person ordinarily skilled in the art could have easily conceived of the structure of Invention 1 regarding Difference 5.

(3) Defendant's allegation

A. The defendant alleges that a person ordinarily skilled in the art could have easily conceived of combining Cited Invention 1 with Cited Invention 2 because these inventions have in common: the technical field; the characteristics of decoloring thermochromic handwriting; the problem of needing to prevent damage to the thermochromic layer with friction heat; and the function and effect of discoloring (decoloring) thermochromic images by heat generated by friction.

However, as mentioned in (2)D. above, [i] while Cited Invention 1 is a writing implement such as a pen which is filled with reversible thermochromic ink composition, and handwriting of thermochromic images can be produced on any medium such as paper by using this writing implement itself, [ii] Cited Invention 2 is a set of writing tools comprising a writing implement, a supporting body on which a thermochromic layer is formed, and other tools, and the cooling pen, which is a writing implement, is in itself unique in that it is filled with a piece of ice or cold water and thus cooled to the point of discoloration on the lower-temperature side or a lower temperature and it does not contain ink or pigment, and unlike an ordinary type of writing implement which produces handwriting with ink or lead, the cooling pen alone cannot produce any handwriting of thermochromic image and it can produce ahandwriting only on the thermochromic layer formed on the surface of the supporting body, which forms a set together with it. Thus, these inventions can be considered to be considerably different in terms of the structure and the function to produce handwriting. Consequently, it is unlikely for a person ordinarily skilled in the art to have easily conceived of combining Cited Invention 1 with Cited Invention 2. Furthermore, as mentioned in (2)E. above, even if a person ordinarily skilled in the art could have easily conceived of combining Cited Invention 1 with Cited Invention 2, it cannot be said that the person could have easily conceived of the structure of Invention 1 regarding Difference 5.

B. The defendant alleges that putting the friction tool 9, an erasing tool, on the bottom of the writing implement or the top of its cap is equal to adopting the well-known or commonly used structure such as a writing implement with a rubber eraser disclosed in Exhibits Ko 10, 11, 13, 14, and 52, in addition to Cited Documents 3, 4, 7 and 8, and therefore that a person ordinarily skilled in the art could have easily conceived of this structure.

However, as mentioned in (2)E(C) above, the friction tool 9 is designed to generate friction heat to decolor, by heat, colored handwriting produced with a reversible thermochromic ink composition comprising color-holding reversible thermochromic microencapsulated pigment which is a color-holding type wherein the colored state in a temperature range not higher than the point of discoloration on the lower-temperature side or the decolored state in a temperature range not lower than the point of discoloration on the higher-temperature side can be held within a specific temperature range, and thus, it is different in nature from a tool that simply functions to erase handwriting.

According to Cited Documents 3, 4, 7, and 8, Exhibits Ko 10, 11, 13, 14, and 52, although it can be found that putting a tool that simply functions to erase handwriting, such as a rubber

eraser, to the bottom of a writing implement or the top of its cap is a well-known or commonly used structure, it cannot be said that the friction tool 9 as described above was well-known among persons ordinarily skilled in the art as a structure to be used as above.

Furthermore, even if a person ordinarily skilled in the art could have easily conceived of putting the friction tool 9 on the bottom of a writing implement or the top of its cap, as mentioned in (2)E(D) above, the person would need to go through the two steps in order to arrive at the structure of Invention 1 regarding Difference 5 based in Cited Invention 1, which would require considerable efforts. Therefore, this cannot be regarded as an easy task for a person ordinarily skilled in the art.

(4) Summary

For these reasons, it cannot be said that a person ordinarily skilled in the art could have easily conceived of the structure of Invention 1 regarding Difference 5, and consequently, the JPO erred in determining that a person ordinarily skilled in the art could have easily conceived of the structure of Invention 1 regarding Difference 5.

7. Whether a person ordinarily skilled in the art could have easily conceived of the Invention

(1) As mentioned in 6. above, Invention 1 cannot be regarded as one that a person ordinarily skilled in the art could have easily conceived of based on Cited Invention 1.

(2) Invention 5 is made by adding a limitation to Invention 1, and therefore it cannot be regarded as one that a person ordinarily skilled in the art could have easily conceived of based on Cited Invention 1.

(3) Inventions 6 and 7 are made by adding a limitation to Invention 1 or 5, and therefore they cannot be regarded as one that a person ordinarily skilled in the art could have easily conceived of based on Cited Invention 1.

(4) Invention 9 is made by adding a limitation to Invention 1, 5, 6 or 7, and therefore it cannot be regarded as one that a person ordinarily skilled in the art could have easily conceived of based on Cited Invention 1.

8. Conclusion

For the reasons stated above, there are errors in the JPO's determination on whether a person ordinarily skilled in the art could have easily conceived of the Invention, and the grounds for rescission argued by the plaintiffs have legal basis, and hence the JPO Decision should inevitably be rescinded.

Therefore, the court shall uphold both of the plaintiffs' claims and render a judgment in the form of the main text.

Intellectual Property High Court, Fourth Division

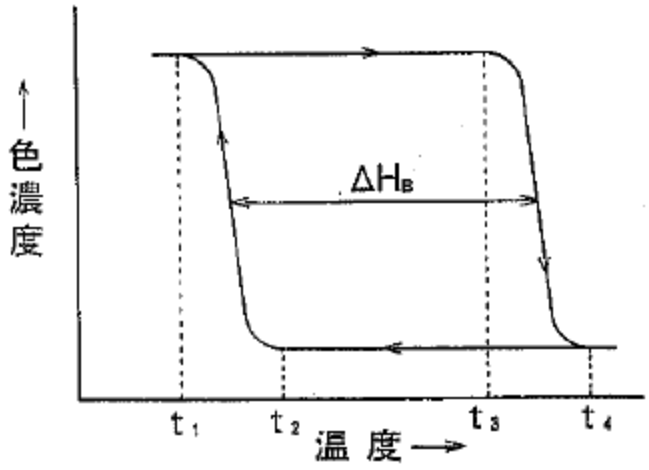
Presiding judge: TAKABE Makiko

Judge: FURUKAWA Kenichi

Judge: SUZUKI Wakana

Attachment 1: Figure in the Description (Exhibit Ko 94)

Fig. 10: Illustration diagram indicating the changes of colors of color-holding thermochromic ink



Color density
Temperature

Attachment 2: Figures in Cited Document 1 (Exhibit Ko 2)

Fig. 4: Longitudinal sectional view of one example of a writing implement of Cited Invention 1

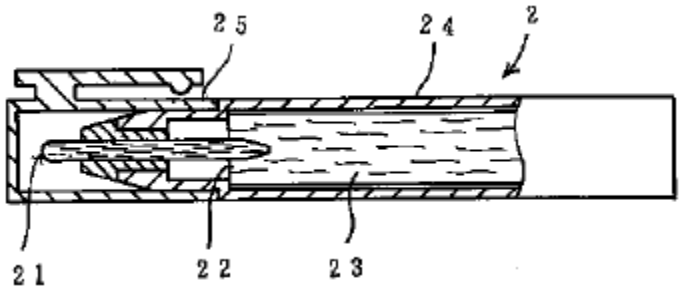
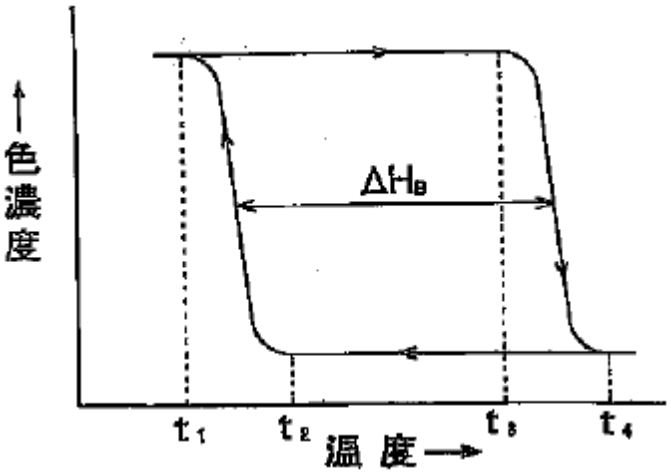


Fig. 8: Graph indicating the changes of colors of a color-holding thermochromic composition

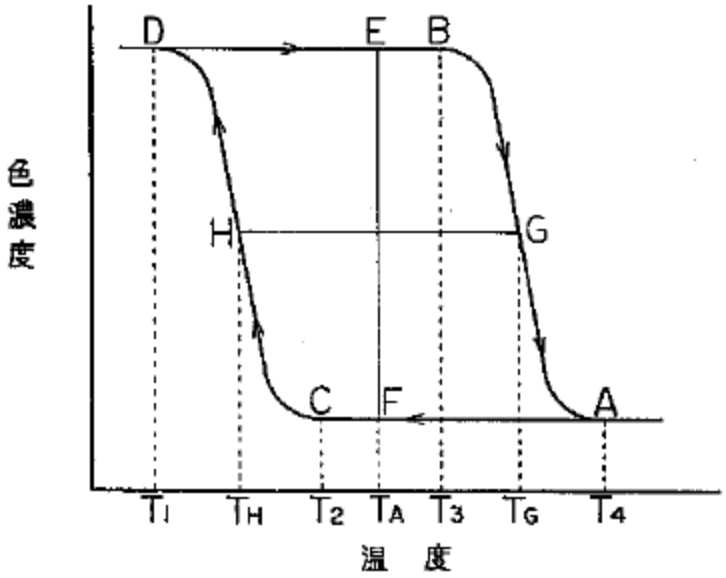


Color density

Temperature

Attachment 3: Figure in Cited Document 6 (Exhibit Ko 79)

Fig. 1: Graph illustrating the hysteresis characteristics on the color density-temperature curve of temperature-sensitive color-holding composition



Color density
Temperature

Attachment 4: Figure in Cited Document 2 (Exhibit Ko 3)

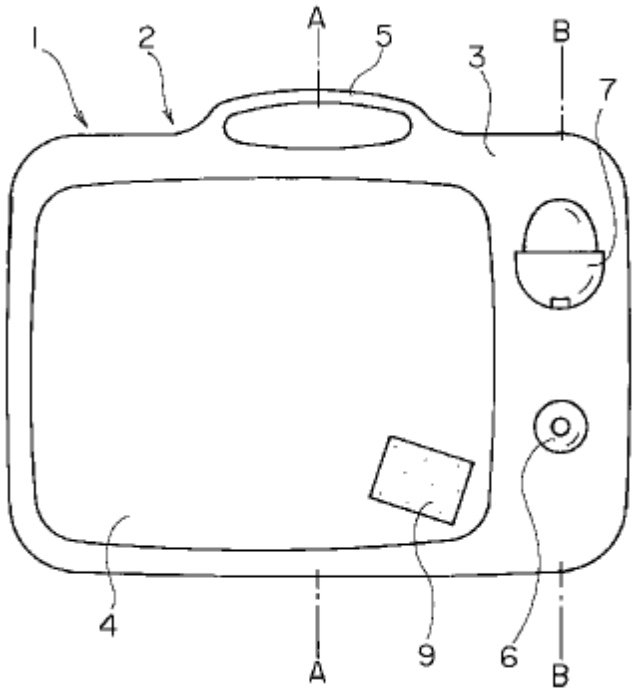


Fig. 1: Plan view of an example of Cited Invention 2