Appeal decision

Appeal No. 2017-16841

Tokyo, Japan
Appellant DIC Corporation

Patent Attorney KONO, Michihiro

The case of appeal against the examiner's decision of refusal for Japanese Patent application No. 2016-33133, titled "NEMATIC LIQUID CRYSTAL COMPOSITION" [published on June 2, 2016, Japanese Unexamined Patent Application Publication No. 2016-102222] has resulted in the following appeal decision.

Conclusion
The appeal of the case is groundless.

Reason
No. 1 History of the procedures

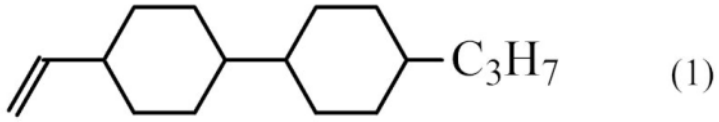
1 History of divisional applications
The original application of the present application was Japanese Patent Application No. 2005-316168 filed on October 31, 2005. Its divisional application was filed on September 27, 2012 as Japanese Patent Application No. 2012-214112. Its divisional application was filed on June 19, 2014 as Japanese Patent Application No. 2014-126275. Its divisional application was filed on October 3, 2014 as Japanese Patent Application No. 2014-204794. Its divisional application, which is the present application, was filed on February 24, 2016.

2 History of the procedures of the present application
The prosecution history after the filing of the present application is generally set forth as below:
October 20, 2016 Submission of written amendment (voluntary) and written statement
On February 17, 2017 Notice of reasons for refusal
On October 17, 2017 Decision of Rejection
November 13, 2017 Submission of notice of appeal and written amendment
On January 30, 2018 Reconsideration report made to the JPO Commissioner in the procedure of reconsideration by examiner before appeal proceedings

No. 2 The Invention

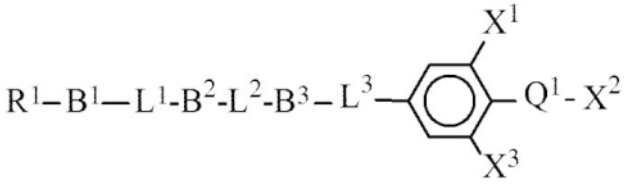
The invention according to Claim 1 of the present application is specified in the matters recited in Claim 1 that have been amended by the written amendment on November 13, 2017 (The invention according to Claim 1 is simply referred to as "Invention".)
Claims 2 to 5 were deleted for the purpose of deleting claims as provided in Article 17bis(5)(i) of the Patent Act according to the written amendment. Thus the

recitation of Claim 1 remains unchanged.
"[Claim 1]
A nematic liquid crystal composition comprising as a first component 30 to 65% of a compound represented by structural formula (1):
[Chemical Formula 1]



(1)

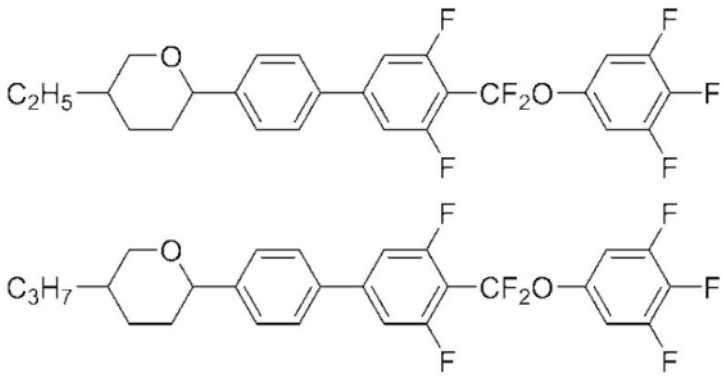
and comprising as a second component three or more kinds of compounds selected from the group represented by general formula (2):
[Chemical Formula 2]



(2)

(where R1 is an alkyl group with a carbon number of 1 to 15 or an alkenyl group with a carbon number of 2 to 15, and B1, B2, and B3 are each groups, independently from each other, selected from the group consisting of (a) a trans-1,4-cyclohexylene group (one CH2 group or two or more nonadjacent CH2 groups present in this group may be replaced with -O-) (b) a 1,4-phenylene group (one CH2 group or two or more nonadjacent CH2 groups present in this group may be replaced with -N-), and the above group (a) and group (b) may be replaced with CH3 or halogen,
L1, L2, L3 each represent, independently from each other, a single bond, -CH2CH2-, -(CH2)4-, -COO-, -OCH2-, -CH2O-, -OCF2-, -CF2O- or -C≡C-,
Q1 is -OCH2-, -OCF2-, OCHF-, -CF2-, or a single bond. X1 to X3 are each, independently from each other, H, F or Cl) and excluding a liquid crystal medium containing any of the following compounds:

[Chemical Formula 3]



."

No. 3 Outline of the examiner's decision

The original decision was a refusal for a reason described in the notice of reasons for refusal on February 17, 2017, specifically for the reasons that the recitation of the

claims of the present application does not satisfy the requirement of Article 36(6)(i) of the Patent Act (the support requirement), and the present invention is not patentable under the provision of Article 29bis of the Patent Act (extended earlier application), and thus not patentable.

In addition, the Appellant did not respond at all to the above notice of reasons for refusal.

No. 4 Judgment by the body

1 Judgment by the body about the support requirement

The recitation of the scope of claims of the present application does not conform to the support requirement.

The reason is discussed in the following.

It should be noted whether the statement of the scope of claims satisfies the Support Requirement of a Description should be determined by considering, through comparison of the statement of the scope of claims and the statement of the detailed explanation of the invention, whether the invention described in the scope of claims is the invention described in the detailed explanation of the invention that is within the scope for which a person ordinarily skilled in the art can recognize, based on the statement of the detailed explanation of the invention, that the invention can solve the problem to be solved by the invention, and also by considering whether the invention described in the scope of claims is an invention within the scope for which a person ordinarily skilled in the art can recognize, in light of the common general technical knowledge as of the time of filing the application, that the invention can solve the problem to be solved by the invention, even without the statement and indication thereof (both scopes are collectively referred to as "the Scope recited in the Detailed Description of the Invention").

(1) The recitation of the claims

The recitation of the scope of the claims of the present application (the recitation of Claim 1) is as per the above "No. 2".

(2) The Scope recited in the Detailed Description of the Invention

A Description of the Detailed Description of the Invention

Paragraphs [0001] to [0008] of the Detailed Description of the Invention describes [Technical field] and [Background Art]. Paragraph [0009] describes [Problem to be solved by the invention] as in the following:

- "[0009]

A problem to be solved by the invention is to provide a liquid crystal composition for an active matrix-type liquid crystal display device having a broad temperature range of liquid crystal phase and a low viscosity, and further to provide an active matrix-type liquid crystal display device having an operating temperature range in which this liquid crystal composition is used."

Further, paragraphs [0010] and [0011] describe a similar content to the recitation of the scope of claims with respect to [Means for solving the problem] and paragraph [0013] describes [Advantage of the Invention] as in the following.

- "[0013]

The combination of the liquid crystal compound of the present invention resulted in a liquid crystal composition for an active matrix-type liquid crystal display device capable of adjusting a broad range of refractive index anisotropy (Δn=0.05 to 0.15), having a broad temperature range of liquid crystal phase, having a nematic phase stable at a low temperature and a very low viscosity, and excellent reliability. The use of this composition results in provision of an active matrix-type liquid crystal display device having a broad operating temperature range, and very practical for a liquid crystal display such as reflection or semitransparent mode."

Furthermore, paragraphs [0014] to [0021] describe the first component and second component, and paragraphs [0022] to [0029] describe the third component as in the following:

- "[Best Mode for Carrying Out the Invention]

[0014]

The content of the compound represented by structural formula (1) as a first component in a liquid crystal composition of the present invention is 30 to 65%, preferably 40 to 60 mass%.

[0015]

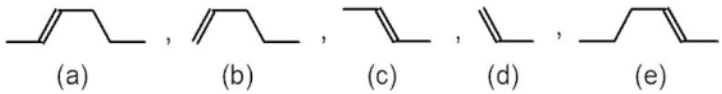
The second component may preferably comprise one kind or two or more kinds from the group of compounds represented by general formula (2), preferably one kind to ten kinds, more preferably one to seven kinds, further preferably two kinds to five kinds.

[0016]

The content of one kind or two or more kinds of compounds selected from the group of compounds represented by general formula (2) as a second component is preferably 5 to 30 mass%, more preferably 10 to 20 mass%. Further, R1 is preferably an alkyl group with a carbon number of 1 to 10, an alkenyl group with a carbon number of 2 to 10, or one in which one CH2 group present in an alkyl group with a carbon number of 2 to 10 is substituted with -O-, more preferably an unsubstituted linear alkyl group with a carbon number of 1 to 8, an alkenyl group with a carbon number of 2 to 8, or one in which one CH2 group present in an alkyl group with a carbon number of 2 to 8 is substituted with -O-, further preferably an alkenyl group with a structure of any of the following formulae (a) to (e):

[0017]

[Chemical Formula 3]



(The structural formula is connected to a ring at the right end.)

[0018]

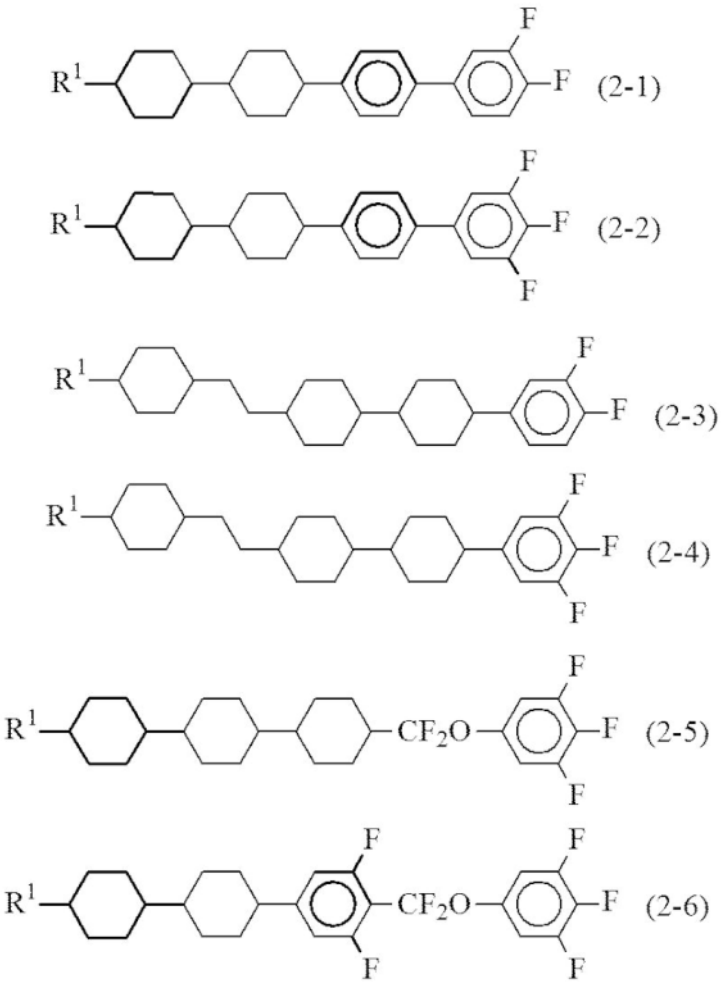
Each of B1, B2, and B3 is preferably a trans-1,4-cyclohexylene group, 1,4-phenylene group, 3-fluoro-1,4-phenylene group, or 3,5-difluoro-1,4-phenylene group, more preferably, a 1,4-phenylene group or trans-1,4-cylcohexylene group. Each of L1, L2, and L3 is a single bond, -CH2CH2-, -(CH2)4-, -COO-, -OCH2-, -CH2O-, -OCF2-, -CF2O- or -C≡C-, preferably -CH2CH2-, -OCF2-, -CF2O- or a single bond, more preferably -CH2CH2-, -CF2O- or a single bond, particularly preferably -CH2CH2- or a single bond.

[0019]

Q1 is -OCH2-, -OCF2-, -OCHF-, -CF2- or a single bond, preferably -OCF2-, -CF2- or a single bond, more preferably a single bond. X1 to X3 are each,

independently from each other, H, F, or Cl, -H and -F are preferable, X2 is preferably F.
[0020]

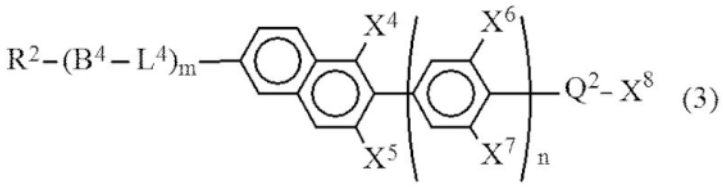
For more details, the specific structure of general formula (2) is preferably any of the following compounds:
[0021]
[Chemical Formula 4]



(where R1 represents, independently, an alkyl group with a carbon number of 1 to 15 or an alkenyl group with a carbon number of 2 to 15.)"

- "[0022]

The third component may preferably comprise one kind or two or more kinds of compounds selected from the group of compounds represented by general formula (3):
[0023]
[Chemical Formula 5]



(where R2 represents the same as R1,
B4 represents the same as B1,

L4 represents the same as L1,
B4 and L4 may be the same or different from each other when they are present in plural numbers, and m is 0, 1, or 2,
n is 0 or 1,
Q2 is -OCH2-, -OCF2-, OCHF-, -CF2-, or a single bond. X4 to X8 are, independently from each other, H, F, or Cl) for adjusting physical properties of the composition and further achieving low viscosity and low voltage.
[0024]

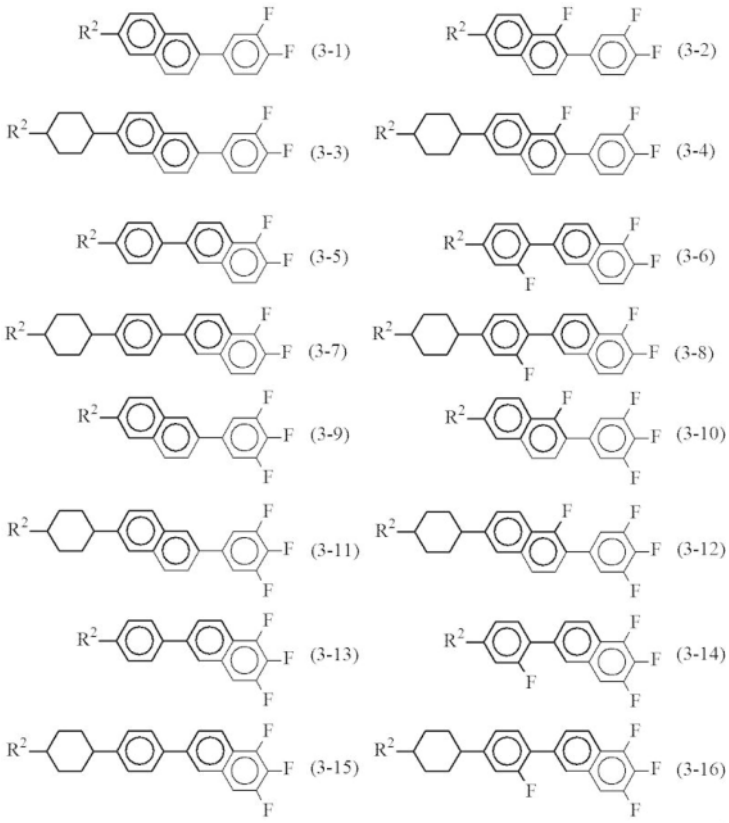
The third component may preferably comprise two to fifteen kinds of compounds represented by general formula (3) as a third component, and more preferably two to ten kinds, further preferably four kinds or seven kinds.
[0025]

The content of one kind or two or more kinds of compounds selected from the group of compounds represented by general formula (3) as a third component is preferably 5 to 30 mass%, more preferably 10 to 30 mass%. Further, each of R3 to R5 is preferably an alkyl group with a carbon number of 1 to 10 or an alkenyl group with a carbon number of 2 to 10, more preferably an unsubstituted linear chain alkyl group with a carbon number of 1 to 8 or an alkenyl group with a carbon number of 2 to 8, further preferably an alkenyl group with a structure of any of formulae (a) to (e).
[0026]

B4 is preferably a trans-1,4-cyclohexylene group, 1,4-phenylene group, 3-fluoro-1,4-phenylene group, or 3,5-difluoro-1,4-phenylene group, more preferably, a 1,4-phenylene group or trans-1,4-cylcohexylene group. L4 is a single bond, -CH2CH2-, -(CH2)4-, -OCH2-, -CH2O-, -OCF2-, -CF2O- or -C≡C-, preferably -CH2CH2-, -OCF2-, -CF2O- or a single bond, more preferably -CH2-CH2-, -CF2O- or a single bond, particularly preferably -CH2CH2- or a single bond. m is 0, 1, or 2, n is 0 or 1, and m+n is preferably 1 or 2.
[0027]

Q2 is -OCH2-, -OCF2-, -OCHF-, -CF2- or a single bond, preferably -OCF2-, -CF2- or a single bond, more preferably a single bond. X4 to X8 are, independently from each other, H, F, or Cl, preferably -H or -F, and X8 is preferably F.
[0028]

For more details, the specific structure of general formula (3) is preferably the compound represented by the following formulae:
[0029]
[Chemical Formula 6]



(where, R2 represents, independently, an alkyl group with a carbon number of 1 to 15 or an alkenyl group with a carbon number of 2 to 15.)"

The paragraphs [0033] to [0050] describe [Examples] as in the following:

- "[Examples]

[0033]

The present invention is explained hereinafter in further detail with reference to examples, but the present invention is not restricted by these examples. Further, "%" in the compositions of the following examples and comparative examples means "mass%".

[0034]

TN-I: Nematic Given a phase-isotropic liquid phase transition temperature (C) to be an upper limit temperature of liquid crystal phase

T->N: Solid phase or smectic phase-nematic phase transition temperature (C) is set to a lower limit temperature of liquid crystal phase.

Δε: Dielectric coefficient anisotropy

Δn: Refractive index anisotropy

γ1: Rotational viscosity

HR: retention rate (%) at 60°C (injecting into TN-LCD with a cell thick of 6 μm, and a ratio of measured voltage to initial applied voltage when measured with an applied voltage of 5V a frame time of 200 ms, a pulse width of 64 μs is represented by %.)

The following abbreviation is used for the description of compounds:

Terminal n (number) CnH2n+1-

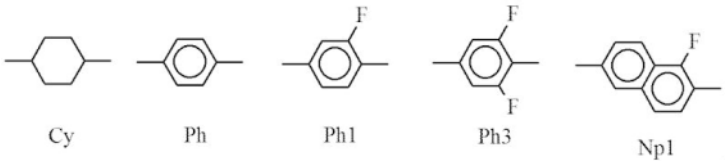
2 -CH2-CH2-

On -OCnH2n+1

F -F
CFFF -CF3
OCFFF -OCF3
ndm- CnH2n+1-C=C-(CH2)m-1-
nOm- CnH2n+1-O-(CH2)m-1-
-E- -COO-
-T- -C≡C-

[0035]

[Chemical Formula 7]



[0036]

(Examples 1 to 3) Adjustment of liquid crystal composition

The following nematic liquid crystal compositions (No. 1), (No. 2), and (No. 3) were prepared and their physical properties were measured. The results are shown in Table 1.

[0037]

[Table 1]

		実施例1 (No.1)	実施例2 (No.2)	実施例3 (No.3)
組成	第一成分			
	0d1-Cy-Cy-3	40%	50%	59%
	第一成分類似化合物			
	0d1-Cy-Cy-5	14%		
	第二成分			
	2-Cy-Cy-Ph-Ph1-F	3%	4%	6%
	3-Cy-Cy-Ph-Ph1-F	6%	6%	6%
	4-Cy-Cy-Ph-Ph1-F	6%	6%	6%
	第三成分			
	3-Np1-Ph3-F	13%	13%	13%
	その他			
	0d1-Cy-Cy-Ph1-F	5%	4%	2%
	3-Ph-T-Ph-1			8%
	0d3-Ph-T-Ph-3d0	13%	17%	
T_{N-I} (℃)		70.8	70.0	70.0
$T_{\rightarrow N}$ (℃)		-25	-31	-20
Δε		3.0	3.0	3.0
Δn		0.106	0.115	0.098
η		9.5	9.4	9.6
γ1		33	33	35
HR (%)		96	96	96
HR (%) 加熱150℃1時間後		96	96	96

組成 Composition

第一成分 First Component

第一成分類似化合物 First Component Analogous Compound

第二成分　Second Component
第三成分　Third Component
その他　Others
加熱 150℃1 時間後　One hour after heating at 150°C
実施例　Example

[0038]
The nematic liquid crystal compositions (No. 1) to (No. 3) of Examples 1 to 3 showed desired values in all properties of nematic phase-isotropic liquid phase transition temperature (TN-I), solid phase or smectic phase-nematic phase transition temperature (T->N), dielectric coefficient anisotropy (Δε), and refractive index anisotropy (Δn). They also showed a low viscosity, and good response rate of a panel, and furthermore, retained an initial retention rate one hour after heating at 150°C, and had good reliability.
[0039]
(Comparative Examples 1 to 3) Adjustment of liquid crystal composition
The following nematic liquid crystal compositions (R1) to (R3) were prepared as comparative examples and their physical properties were measured. The results are shown in Table 2.
[0040]

[Table 2]

		比較例1 (R1)	比較例2 (R2)	比較例3 (R3)
組成	第一成分			
	0d1-Cy-Cy-3	30%	30%	30%
	第一成分類似化合物			
	0d1-Cy-Cy-5	23%	19%	9%
	0d3-Cy-Cy-3	5%	5%	5%
	第二成分			
	2-Cy-Cy-Ph-Ph1-F	3%	3%	5%
	3-Cy-Cy-Ph-Ph1-F	6%	6%	6%
	4-Cy-Cy-Ph-Ph1-F	6%	6%	6%
	第三成分			
	3-Np1-Ph3-F	13%	13%	13%
	その他			
	0d1-Cy-Cy-Ph1-F	5%	5%	3%
	3-Ph-T-Ph-1			6%
	0d3-Ph-T-Ph-3d0	9%	13%	17%
T_{N-I} (℃)		74.1	73.2	71.3
T_{-N} (℃)		-46	-40	-31
Δε		3.0	3.0	3.1
Δn		0.100	0.108	0.130
η		10.6	10.0	10.4
γ1		37	38	39
HR (%)		96	96	96
HR (%) 加熱150℃1時間後		96	96	96

組成　Composition

第一成分　First Component
第一成分類似化合物　First Component Analogous Compound
第二成分　Second Component
第三成分　Third Component
その他　Others
加熱 150℃1 時間後　One hour after heating at 150°C
比較例　Comparative Example

[0041]
Comparative Example 1 to Comparative Example 3 were made so that the content of the first component might be 30%, and showed higher viscosity compared to Examples.
[0042]
(Comparative Example 4) Adjustment of liquid crystal composition
The following nematic liquid crystal composition (R4) was prepared as a comparative example and its physical properties were measured. The results are shown in Table 3.
[0043]

[Table 3]

		比較例4 (R4)
組成	第一成分	
	第二成分	
	第三成分	
	その他	
	5-Cy-Ph-F	10%
	6-Cy-Ph-F	15%
	7-Cy-Ph-F	15%
	3-Cy-Cy-Ph-OCFFF	20%
	3-Cy-Cy-2-Ph-OCFFF	20%
	5-Cy-Cy-2-Ph-OCFFF	20%
T_{N-I} (℃)		65
Δ ε		5.6
Δn		0.074
η		11

組成　Composition
第一成分　First Component
第二成分　Second Component
第三成分　Third Component
その他　Others

比較例　Comparative Example

[0044]

Comparative Example 4 Nematic liquid crystal composition (R4) showed a higher viscosity compared to Example, and showed an insufficient response rate of a panel. Further, nematic phase-isotropic liquid phase transition temperature (TN-I) was as low as 65℃, and thus the liquid phase had a narrow temperature range, and thus could not be used as a practical liquid crystal composition.

[0045]

(Comparative Examples 5 to 8) Adjustment of liquid crystal composition

The following nematic liquid crystal compositions (R5) to (R8) were prepared as comparative examples and their physical properties were measured. The results are shown in Table 4.

[0046]

[Table 4]

		比較例5 (R5)	比較例6 (R6)	比較例7 (R7)	比較例8 (R8)
組成	第一成分				
	第一成分類似化合物				
	0d1-Cy-Cy-5	12%	11%	11%	6%
	0d3-Cy-Cy-3				6%
	第二成分				
	第三成分				
	その他				
	7-Cy-Ph-F		9%		
	2-Cy-Cy-Ph-OCFFF	9%	9%	7%	9%
	3-Cy-Cy-Ph-OCFFF	7%	8%	8%	8%
	4-Cy-Cy-Ph-OCFFF	5%	5%		7%
	5-Cy-Cy-Ph-OCFFF	8%	8%	8%	9%
	2-Cy-Cy-Ph3-F	10%	10%	9%	10%
	3-Cy-Cy-Ph3-F	11%	11%	10%	11%
	5-Cy-Cy-Ph3-F	6%	6%	8%	7%
	2-Cy-Ph1-Ph3-F	4%		8%	
	3-Cy-Ph1-Ph3-F	8%		9%	11%
	5-Cy-Ph1-Ph3-F	7%		10%	
	2-Cy-Cy-Ph3-OCFFF		12%		
	0d1-Cy-Cy-Ph1-F	13%	11%	12%	10%
	1d1-Cy-Cy-Ph1-F				6%
T_{N-I} (℃)		85	83	77	98
$T_{\rightarrow N}$ (℃)		-40			
Δε		7.8	6.1		
Δn		0.086	0.076	0.088	0.086
γ1		108	101	107	98

組成　Composition

第一成分　First Component

第一成分類似化合物　First Component Analogous Compound
第二成分　Second Component
第三成分　Third Component
その他　Others
比較例　Comparative Example

[0047]

Comparative Examples 5 to Comparative Example 8 Nematic liquid crystal compositions (R5) to (R8) showed a higher nematic phase-isotropic liquid phase transition temperature (TN-I), whereas they showed a higher viscosity compared to Examples, and showed an insufficient response rate of a panel.

[0048]

(Comparative Example 9) Adjustment of liquid crystal composition

The following nematic liquid crystal composition (R9) was prepared as a comparative example and its physical properties were measured. The results are shown in Table 4.

[0049]

[Table 5]

		比較例9 (R9)
組成	第一成分	
	第二成分	
	第三成分	
	その他	
	5-Cy-Ph-F	6%
	7-Cy-Ph-F	7%
	3-Cy-Ph-O2	4%
	2-Cy-Cy-Ph1-F	6%
	5-Cy-Cy-Ph1-F	7%
	3-Cy-Cy-E-Ph1-F	10%
	2-Cy-Cy-Ph3-F	8%
	3-Cy-Cy-Ph3-F	10%
	5-Cy-Cy-Ph3-F	9%
	3-Cy-Cy-Ph3-CFFF	12%
	5-Cy-Cy-Ph3-CFFF	11%
	3-Cy-Cy-2-Cy-Ph1-F	5%
	5-Cy-Cy-2-Cy-Ph1-F	5%
T_{N-I} (℃)		87
Δn		0.082
η		17

組成　Composition
第一成分　First Component

第二成分　Second Component
第三成分　Third Component
その他　Others
比較例　Comparative Example

[0050]
Comparative Example 9 Nematic liquid crystal composition (R9) had a higher nematic phase-isotropic liquid phase transition temperature (TN-I), whereas it showed a higher viscosity compared to Example, and showed an insufficient response rate of a panel."

B　Problem to be solved by the Invention
According to the above paragraph [0009] of the Detailed Description of the Invention, it can be said that the problem to be solved by the present invention (nematic liquid crystal composition) is to provide a liquid crystal composition for an active matrix-type liquid crystal display device having a broad temperature range of liquid crystal phase and a low viscosity.

C　Examination on "the Scope recited in the Detailed Description of the Invention"
As in the above B, the problem to be solved by the present invention is to achieve properties of "a broad temperature range of liquid crystal phase and a low viscosity" (hereinafter simply referred to as "desired properties"). Thus the Detailed Description of the Invention should be considered by focusing on the causal relationship between the nematic liquid crystal composition and the "desired properties" of the present invention (mechanism how the present invention causes the "desired properties" or how the problem is solved).
Paragraphs [0014] to [0021] of the Detailed Description of the Invention disclose the first component and the second component of the present invention. However, they fail to disclose how the effect is caused by these components (in particular, these specific chemical structures) regarding the above "desired properties". Thus a person skilled in the art could not recognize the causal relationship between these components and the "desired properties" (the mechanism) on the basis of the description.
Paragraphs [0022] to [0029] disclose the third component, which the present invention does not include essentially. The third component may very much contribute to the above "desired properties" according to the statements of "it preferably comprises one kind or two or more kinds of compounds selected from the group of compounds represented by ... as a third component for adjusting physical properties of the composition and further achieving low viscosity and low voltage." ([0022], [0023]).
Furthermore, [Examples] of the paragraphs [0033] to [0050] disclose Examples 1 to 3 (see [0037][Table 1]) and Comparative Examples 1 to 3 (see [0040][Table 2]) as specific examples of nematic liquid crystal composition including the above first component and the second component. It can be seen from the table that each of these specific examples has "0d1-Cy-Cy-3" as a first component, one of three specific kinds, "2-Cy-Cy-Ph-Ph1-F", "3-Cy-Cy-Ph-Ph1-F", and "4-Cy-Cy-Ph-Ph1-F" as a second component, and additionally contains the other compound including "a third component". Comparative Examples 4 to 9 described in [Examples] contain not all of

the first component, the second component, and the third component. Thus the effect caused by the first component and the second component alone cannot be understood on basis of the results from these comparative examples and the above Examples. Or, it cannot be decided whether the effect caused by the first component and the second component alone or by the third component in addition to them, which is described as an influencing factor for the above "desired properties."

Consequently, a person skilled in the art who reads the [Examples] could understand on the basis of the numerical values such as "TN-I(C)", "T->N(C)", and "γ1" of the above Table that the specific examples including the above Examples have the "desired properties." However, as aforementioned, the Detailed Description of the Invention does not explicitly describe the effect of the first component and the second component (their specific chemical structure) regarding the "desired properties." It definitely describes that the third component is an influencing factor of the "desired properties". Thus it is reasonable to find that even a person skilled in the art could not understand that the "desired properties" based on the specific example are caused by the first component and the second component alone.

In addition, even if a second component might have a great impact on the "desired properties", as aforementioned, it would have to be said that the causal relationship between its specific chemical structure and the "desired properties" (action mechanism) is uncertain. Thus a person skilled in the art may recognize that the above "desired properties" might be exhibited only in an embodiment using the three specific kinds of compounds described in the above [Examples] with a specific mixing amounts; i.e., "2-Cy-Cy-Ph-Ph1-F", "3-Cy-Cy-Ph-Ph1-F", and "4-Cy-Cy-Ph-Ph1-F" or in an equivalent embodiment exhibiting a same efficacy on the basis of a common general knowledge. And he or she may recognize that the problem to be solved can be solved in this case. However, in other cases, a person skilled in the art would not recognize that the problem to be solved might be solved.

(3) Examination on Support Requirement

The present invention may contain components other than the first component and the second component as in the above (1). The second component falls within a broad range of compounds other than specific three kinds described in the above [Examples]. Further, the mixing amount is not limited.

On the other hand, as in the above (2), it cannot be said that "the Scope recited in the Detailed Description of the Invention" covers a composition composed only of the first component and the second component (because it cannot be said that the combination of the first component and the second component might solve the problem to be solved by the present invention). Further, also regarding the second component, the scope of the second component recognized as "the Scope recited in the Detailed Description of the Invention" is limited to the case of using the three specific kinds with specific mixing amounts described in the above [Examples], or the case where it can be presumed from the common general knowledge that a similar efficacy is exhibited. There is no common general knowledge sufficient to find that the case where it can be presumed that an efficacy similar to the case of using the three specific kinds with specific mixing amounts is exhibited may be extended or generalized to the scope of the second component of the present invention.

Consequently, it cannot be recognized that the invention recited in the scope of claims (the present invention) falls within "the Scope recited in the Detailed Description

of the Invention". Thus it cannot be said that the recitation of the scope of claims of the present application conforms to the support requirement.

2 Judgment by the body with regard to the extended Earlier Application

The present invention is identical to the invention described in the specification, the claims, or drawings originally attached to the following Earlier Application, which is a patent application filed before the filing date of the present application and published after the filing date of the present application. Further, the inventor of the present application is not identical to those who made the invention described in the specification of the Earlier Application, nor was the Applicant of the present application identical to the applicant of the Earlier Application when the present application was filed. Thus the inventions of the present application are not patentable under the provision of Article 29bis of the Patent Act.

<the Earlier Application>

Japanese Patent Application No. 2006-144861 shown as Earlier Application 2 in the original decision

(Laying-open of unexamined application: Japanese Unexamined Patent Application Publication No. 2006-328399, Priority date: May 25, 2005, hereinafter the earlier application 2 is simply referred to as the "Earlier Application", and the specification, the scope of claims and the drawings originally attached to the application of the "Earlier Application" are referred to as "the specification etc. of the Earlier Application" (limited to a part that can claim the benefit of priority).)

The reason is discussed in the following.

(1) The description of the specification of the Earlier Application

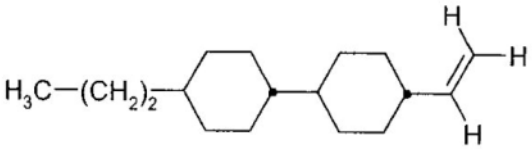
A The scope of claims

- "[Claim 1]

A liquid crystal medium comprising: a dielectrically neutral component A comprising a dielectrically neutral compound represented by

- Formula I:

[Chemical Formula 1]



I

;

and

a dielectrically positive component B comprising one kind or two or more kinds of dielectrically positive compounds having dielectric anisotropy greater than -3;

and wherein the concentration of the component A in a medium ranges from 20% to 80%.

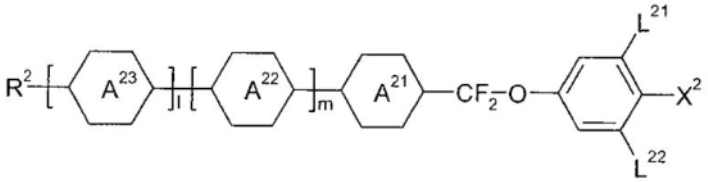
[Claim 2]

The liquid crystal medium of Claim 1, wherein the concentration of the component A in a medium ranges from 25% to 60%.

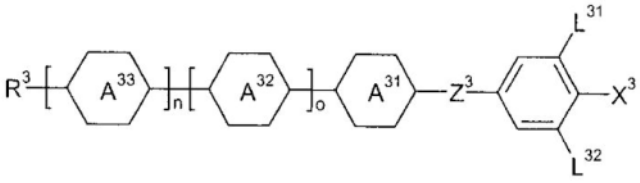
[Claim 3]

The liquid crystal medium of Claim 1 or 2, wherein the dielectrically positive component B comprises one kind or two or more kinds of compounds selected from the

group of compounds represented by formulae II and III:
[Chemical Formula 2]



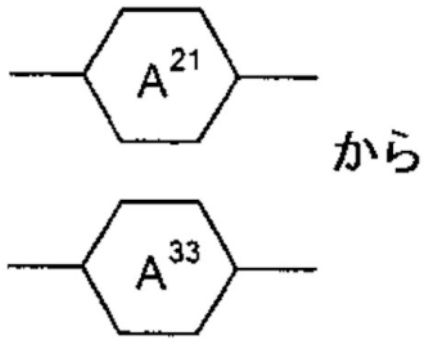
II



III

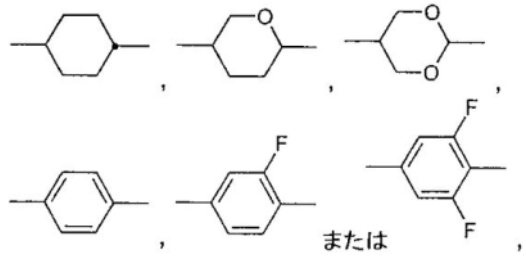
where
R2 and R3 are each, independently from each other, an alkyl, alkoxy, fluorinated alkyl, or fluorinated alkoxy with 1 to 7 carbon atoms, or an alkenyl, alkenyloxy, alkoxyalkyl, or fluorinated alkenyl with 2 to 7 carbon atoms,

Formulas from A^{21} to A^{33}
[Chemical Formula 3]



から to

are, independently from each other, any of the followings:
[Chemical Formula 4]



または or

L21, L22, L31, and L32, independently from each other, each represent H or F,

and X2 and X3 are each, independently from each other, represents a halogen, halogenated alkyl, or alkoxy with 1 to 3 carbon atoms, or a halogenated alkenyl or alkenyloxy with 2 to 3 carbon atoms,
Z3 is -CH2CH2-, -CF2CF2-, -COO-, trans-CH=CH-, trans-CF=CF-, -CH2O-, or a single bond, and
l, m, n and o, independently from each other, each represent 0 or 1."

B Technical field/Background Art

- "[Technical field]

[0001]

The present invention relates to a liquid crystal medium and a liquid crystal display comprising these media, in particular, a display addressable by active matrix, and in particular, a twisted nematic (TN) or in plane switching (IPS) display.

[Background Art]

[0002]

Liquid crystal displays (LCD) are widely used for the display of information. LCDs are used for a direct visual display and a projection display. Electrooptical modes used may include, for example, twisted nematic (TN) mode, super-twisted nematic (STN) mode, optical compensation bend (OCB) mode, electric field controlled birefringence (ECB) mode, and various modification thereof. All of these modes use an electric field substantially orthogonal to a substrate and a liquid crystal layer, respectively. In addition to these modes, there is also an electrooptic mode substantially parallel with a substrate and a liquid crystal layer, respectively, which includes, for example, an in-plane switching (IPS) mode (for example, the ones disclosed in Patent Document 1 and Patent Document 2). Particularly, this electrooptic mode is used for LCD for a new desktop monitor, and application to a display for multimedia use is expected. The liquid crystal of the present invention is preferably used for this type of display.

[0003]

These displays require a new liquid crystal medium with improved properties. Particularly, the response time needs to be improved for various uses. Therefore, a liquid crystal medium having a low viscosity (η), particularly low rotation viscosity ($\gamma 1$), is required. Rotation viscosity should be 75 mPa*s or less, preferably 60 mPa*s, and particularly preferably 55 mPa*s. In addition to this parameter, a medium must show a preferable broad range of nematic phase. A proper birefringence Δn and dielectric anisotropy ($\Delta\varepsilon$) are required to be sufficiently high as to allow a reasonably low operating voltage. Preferably $\Delta\varepsilon$ is greater than 4, more preferably greater than 5, but preferably 15 or less, particularly 12 or less. This is because of causing harm on at least reasonably high specific resistance."

C Problem to be solved

[Problem to be solved by the invention]

[0007]

Therefore, depending on suitable properties for practical use, for example, a broad range of nematic phase, appropriate optical anisotropy Δn, and a display mode used, there is a great need for a liquid crystal medium having a high $\Delta\varepsilon$ and particularly a low viscosity.

[Means for solving the problem]

[0008]

Surprisingly, it has been found that a liquid crystal medium having a suitably high Δ, suitable phase range and Δn, and free of or at least significantly less defect of the conventional material."

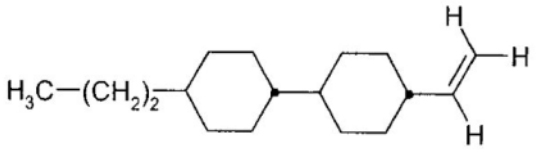
D Each component

- "[0009]

These improved liquid crystal medium of the present application comprises a dielectrically neutral component A comprising a dielectrically positive compound represented by at least the following component:

- Formula I:

[Chemical Formula 1]



I

; and

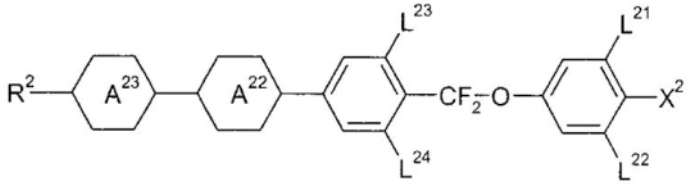
a dielectrically neutral component B comprising one kind or two or more kinds of dielectrically positive compounds having dielectric anisotropy greater than -3,

and a concentration of the component A of said medium is 20% to 80%, more preferably 25% to 70%, further more preferably 30% to 65%, and most preferably 35% to 60%."

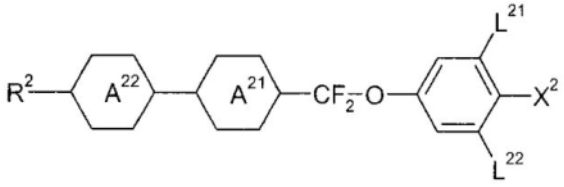
- "[0014]

In a preferred embodiment of the present invention, the component B is one kind or two or more kinds of dielectrically positive compounds having dielectric anisotropy greater than 3, represented by formulae II-1 and II-2:

[Chemical Formula 5]



II-1



II-2

where parameters have the respective meanings given in the above formula II, and parameters L23 and L24 of formula II-1 are, independently from each other and the other parameter, H or F.

More preferably, the component B mainly consists of said compounds, further more preferably almost completely consists of said compounds, and most preferably completely consists of said compounds.

[0015]

Preferably the component B comprises compounds represented by formula II-1 and II-2, and selected from the group of compounds where L21 and L22 or L31 and L32

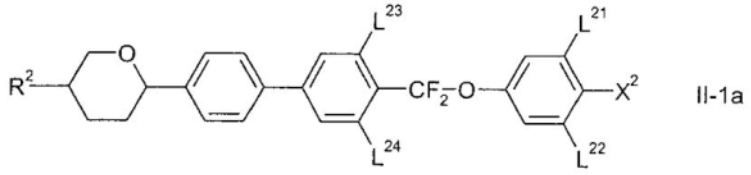
in the formula are both F.

In a preferred embodiment, the component B comprises compounds represented by formulae II-1 and II-2 and selected from the group of compounds where L21, L22, L31, and L32 in the formula are all F.

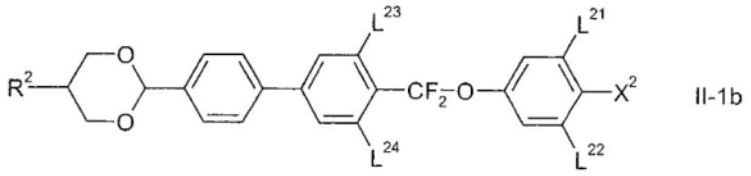
[0016]

Preferably, the component B comprises one kind or two or more kinds of compounds represented by formula II-1. Preferably, the compound represented by formula II-1 is preferably selected from the group of compounds represented by formulae II-1a to II-1e:

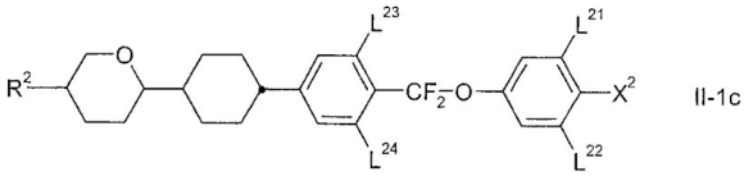
[Chemical Formula 6]



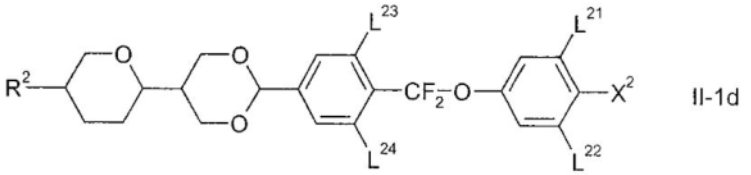
II-1a



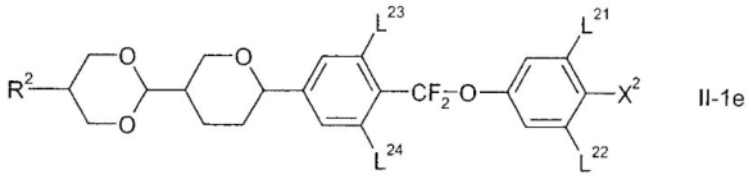
II-1b



II-1c



II-1d



II-1e

where parameters have the respective meanings as provided above.

[0017]

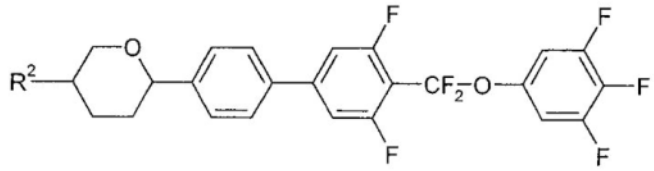
Preferably the component B comprises compounds represented by formulae II-1a and II-1e, and selected from the group of compounds where L21 and L22 or L31 and L32 in the formulae are both F.

In a preferred embodiment, the component B comprises compounds represented by formulae II-1a and II-1e and selected from the group of compounds where L21, L22, L31, and L32 in the formulae are all F.

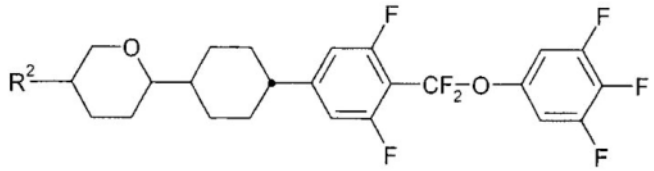
[0018]

A particularly preferable compound represented by formula II-1 is

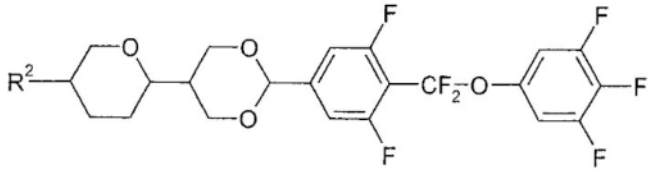
[Chemical Formula 7]



II-1a-1



II-1c-1



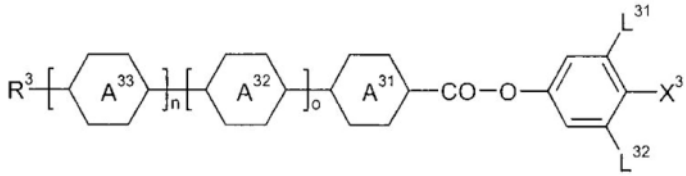
II-1d-1

where R2 has a meaning as provided above."

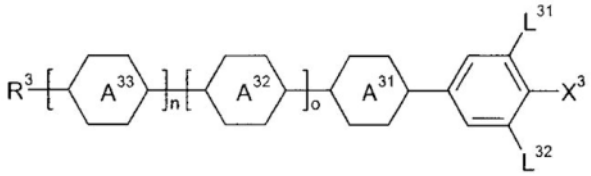
- "[0021]

In a further preferred embodiment of the present invention, the component B comprises one kind or two or more kinds of dielectrically positive compounds having dielectric anisotropy greater than 3 selected from the group represented by formulae III-1 and III-2:

[Chemical Formula 10]



III-1



III-2

where parameters have the respective meanings as provided in the above formula III. More preferably, the component B mainly consists of said compounds, further more preferably almost completely consists of said compounds, and the most preferably completely consists of said compounds.

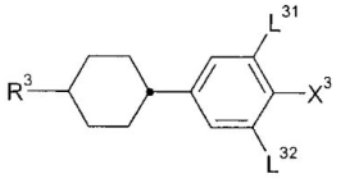
...

[0023]

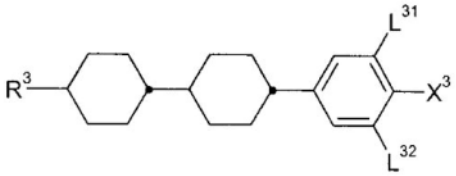
Preferably, the component B comprises one kind or two or more kinds of compounds represented by formula III-2. Preferably, the compound represented by

formula III-2g is preferably selected from the group of compounds represented by formulae III-2a to III-2g:

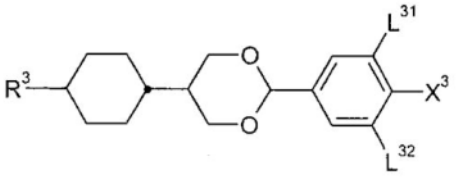
[Chemical Formula 12]



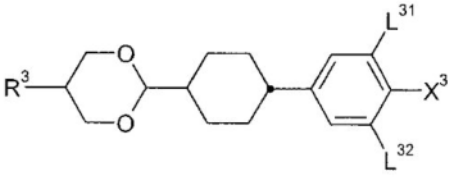
III-2a



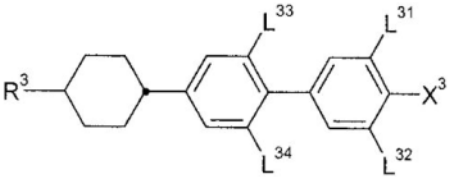
III-2b



III-2c

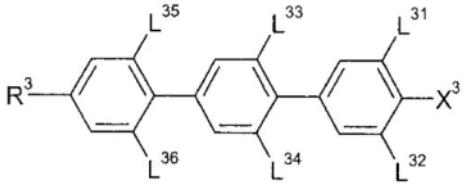


III-2d

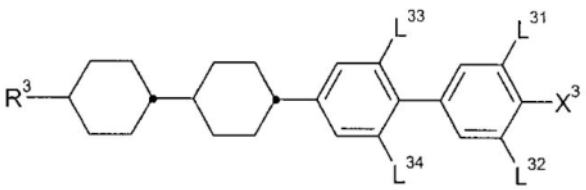


III-2e

[Chemical Formula 13]



III-2f



III-2g

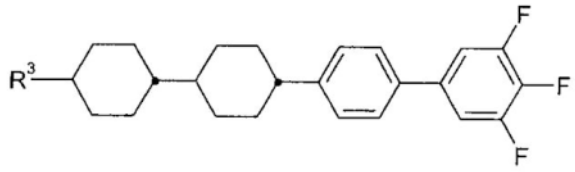
where parameters have the respective meanings as provided above.

...

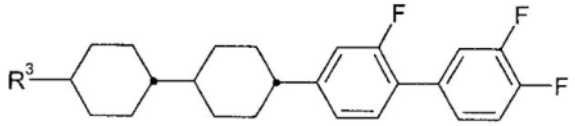
[0030]

Preferably, the component B comprises one kind or two or more kinds of compounds represented by formula III-2g. This is preferably selected from the group of compounds represented by formulae III-2g-1 to III-2g-3:

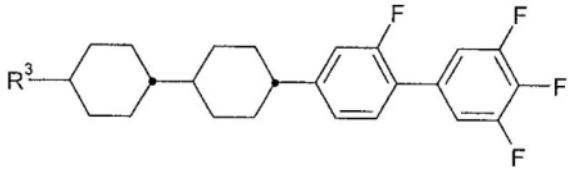
[Chemical Formula 20]



III-2g-1



III-2g-2



III-2g-3

where R3 has a meaning as provided above."

E Regarding properties

- "[0057]

The liquid crystal medium of the present invention is characterized by a transparent point of 70°C or more, preferably 75°C or more, and particularly 80°C or more.

The liquid crystal medium of the present invention preferably has a Δn at 20°C and 589 nm (NaD) of 0.060 or more to 0.135 or less, more preferably 0.070 or more to 0.125 or less, and most preferably 0.080 or more to 0.120 or less.

[0058]

The liquid crystal medium of the present invention has Δε of 4.0 or more at 20°C and 1 kHz.

Preferably a nematic phase of a medium of the present invention spreads over at least 0°C or less to 70°C or more, more preferably at least -20°C or less to 70°C or more, most preferably at least -30°C or less to 75°C or more, and particularly at least -40°C or less to 75°C or more."

F Specific examples

- "[0109]

Example 14

A liquid crystal mixture was prepared, having a composition and properties given as in the following table:

[Table 19]

組成			物理的特性		
化合物			T(N,I)	= 75.0	°C
No.	略号	濃度 /%			
1	CC-3-V	41.0	Δn (20 °C, 589.3 nm)	= 0.1003	
2	PP-1-2V1	5.0			
3	PUQU-2-F	6.0	ε|| (20 °C, 1 kHz)	= 10.9	
4	PGU-3-F	7.0	Δε (20 °C, 1 kHz)	= 7.5	
5	APUQU-2-F	7.0			
6	APUQU-3-F	7.0	γ_1 (20 °C)	= 57	mPa · s
7	CCP-2OCF3	9.0			
8	CCP-V-1	14.0	V_{10} (20 °C)	= 1.53	V
9	CCGU-3-F	4.0	V_{90} (20 °C)	= 2.29	V
Σ		100.0			

組成　Composition
化合物　Compound
略号　Abbreviated symbol
濃度/%　Concentration /%
物理的特性　Physical properties

This mixture has an advantageous Δn value, high Δε value, and low rotational viscosity. Therefore, this is very well suitable for a display operating in TN mode."

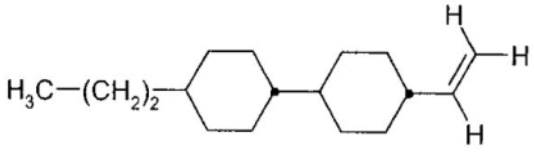
(2) The Invention described in the specification of the Earlier Application (the Earlier Application invention)

It can be said that Claim 3 of the scope of claims of the specification, etc. of the Earlier Application (depending from Claim 1 and Claim 2) recites the following invention:

"A liquid crystal medium comprising: a dielectrically neutral component A comprising a dielectrically neutral compound represented by

- Formula I:

[Chemical Formula 1]



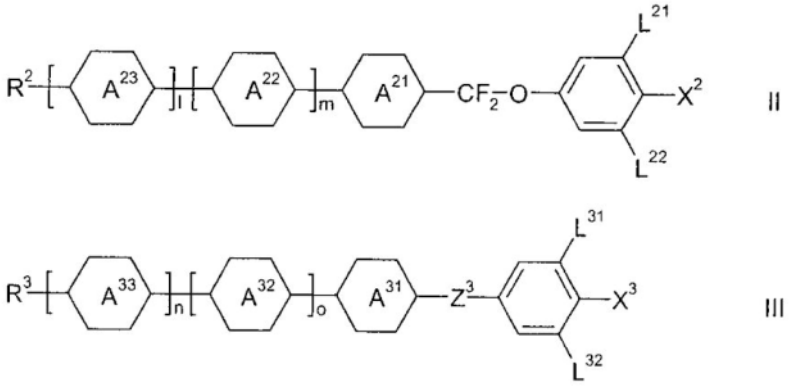
I

; and

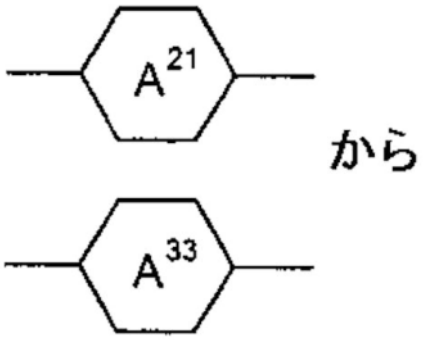
a dielectrically positive component B comprising one kind or two or more kinds of dielectrically positive compounds having dielectric anisotropy greater than -3;

wherein the concentration of the component A in said medium ranges from 25% to 60%, and the dielectrically positive component B comprises one kind or two or more kinds of compounds selected from the group of compounds represented by formula II and III:

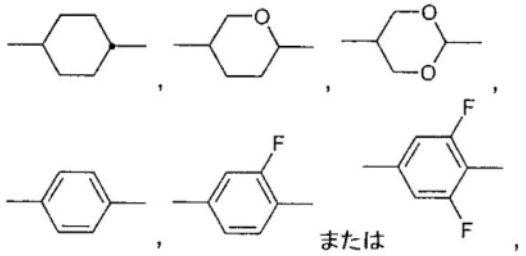
[Chemical Formula 2]



where R2 and R3 are, independently from each other, an alkyl, alkoxy, fluorinated alkyl, or fluorinated alkoxy with 1 to 7 carbon atoms, or an alkenyl, alkenyloxy, alkoxyalkyl or fluorinated alkenyl with 2 to 7 carbon atoms,
Formulas from A^{21} to A^{33}
[Chemical Formula 3]



から to
are, independently from each other, any of the followings:
[Chemical Formula 4]



または or

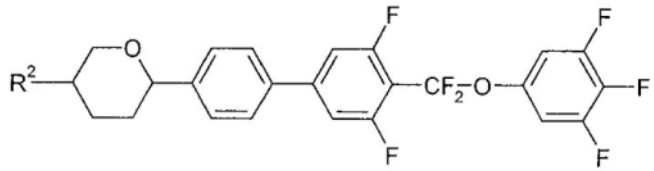
L21, L22, L31, and L32, independently from each other, each represent H or F,
X2 and X3 are, independently from each other, a halogen, halogenated alkyl, or alkoxy with 1 to 3 carbon atoms, or a halogenated alkenyl or alkenyloxy with 2 to 3 carbon atoms,
Z3 is -CH2CH2-, -CF2CF2-, -COO-, trans-CH=CH-, trans-CF=CF-, -CH2O- or a single bond, and

l, m, n and o each, independently from each other, represent 0 or 1."

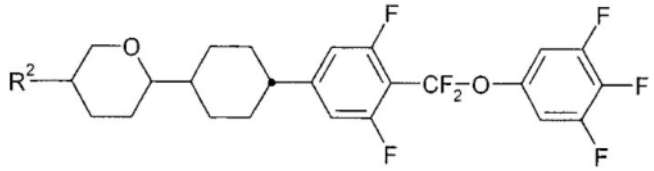
Further, in view of the description of the above B and C (see particularly [0001] and [0007]), the liquid crystal medium is construed as having a goal for high Δε and particularly low viscosity depending on a broad range of nematic phase, an appropriate optical anisotropy Δn, and a display mode used, usable for TN-type (twisted nematic type) liquid crystal display. Further, the above E and F (see in particular [0059] and "T(N,I) of [Table 19]) describe a temperature range of nematic phase. Thus it can be said that the liquid crystal medium is presumed to be a nematic liquid crystal.

Further, the above D describes "the concentration of the component A in a medium ... most preferably ranges from 35% to 60%" ([0009]) with respect to the component A, and with respect to the component B, it describes "a particularly preferable compound represented by formula II-1 is

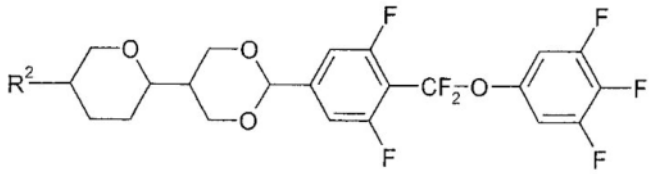
[Chemical Formula 7]



II-1a-1



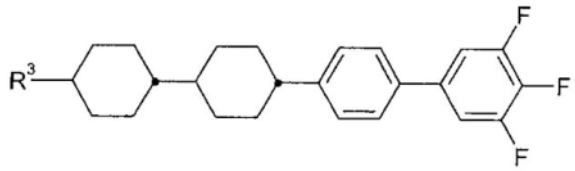
II-1c-1



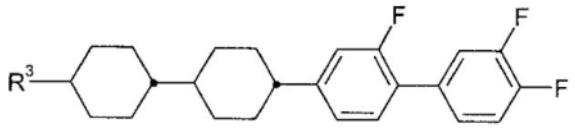
II-1d-1

where R2 has a meaning as provided above." ([0018]), and, "Preferably, the component B comprises one kind or two or more kinds of compounds represented by formula III-2g. This is preferably selected from the group of compounds represented by formulae III-2g-1 to III-2g-3:

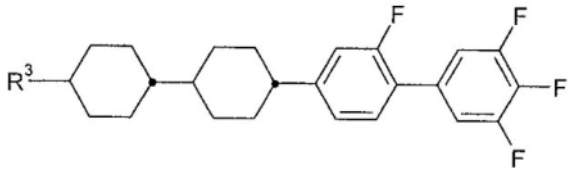
[Chemical Formula 20]



III-2g-1



III-2g-2

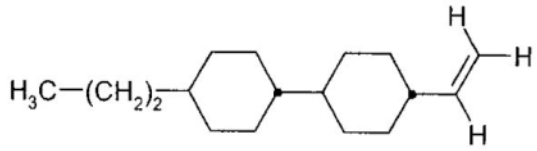


III-2g-3

where R3 has a meaning as provided above."
([0030]).

Comprehensively taking these into account, it is recognized that the specification of the Earlier Application describes the following invention (hereinafter referred to as "the Earlier Application invention"):

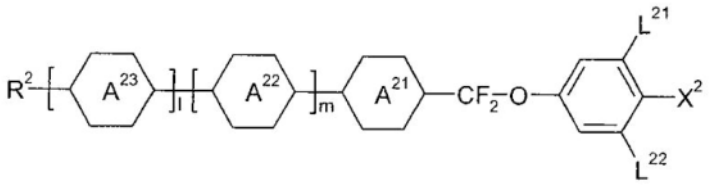
"A nematic liquid crystal medium comprising: a dielectrically neutral component A comprising a dielectrically neutral compound represented by
- Formula I:
[Chemical Formula 1]



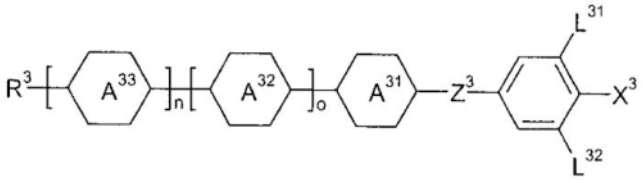
I

;
and
a dielectrically positive component B comprising one kind or two or more kinds of dielectrically positive compounds having dielectric anisotropy greater than -3;

wherein the concentration of the component A in said medium ranges from 25% to 60%, and
most preferably 35% to 60%,
the dielectrically positive component B comprises one kind or two or more kinds of compounds selected from the group of compounds represented by formula II and III:
[Chemical Formula 2]



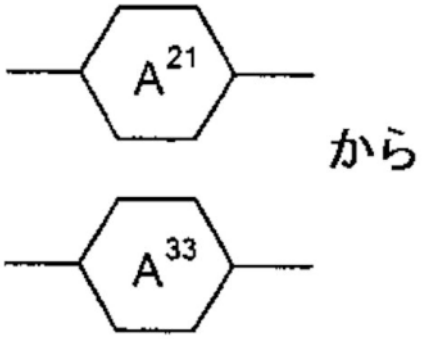
II



III

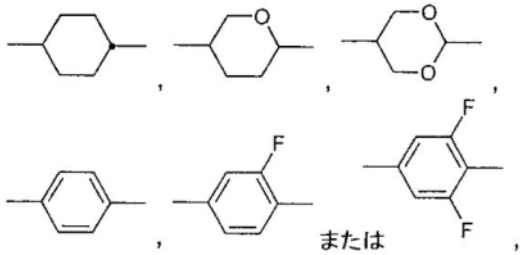
where
R2 and R3 are each, independently from each other, an alkyl, alkoxy, fluorinated alkyl, or fluorinated alkoxy with 1 to 7 carbon atoms, or an alkenyl, alkenyloxy, alkoxyalkyl, or fluorinated alkenyl with 2 to 7 carbon atoms,

Formulas from A^{21} to A^{33}
[Chemical Formula 3]



から　to

are, independently from each other, any of the followings:
[Chemical Formula 4]

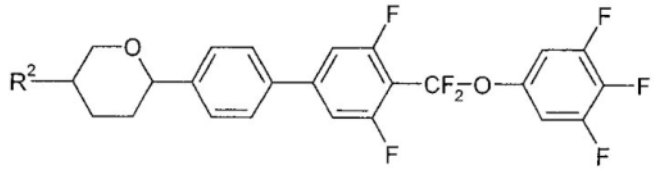


または　or

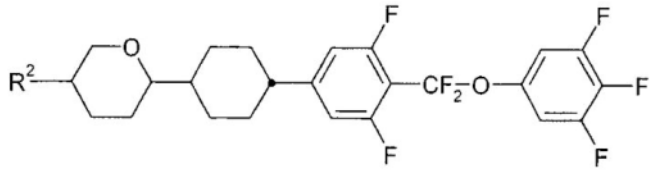
L21, L22, L31 and L32, independently from each other, each represent H or F,
X2 and X3 are, independently from each other, each a halogen, halogenated alkyl, or alkoxy with 1 to 3 carbon atoms, or a halogenated alkenyl or alkenyloxy with 2 to 3

carbon atoms,
Z3 is -CH2CH2-, -CF2CF2-, -COO-, trans-CH=CH-, trans-CF=CF-, -CH2O- or a single bond, and
l, m, n, and o each, independently from each other, represent 0 or 1,
and preferably, the component B comprises one kind or two or more kinds of compounds selected from the group of compounds represented by the following formula II-1a-1, II-1c-1, II-1d-1, or the formulae III-2g-1 to III-2g-3."

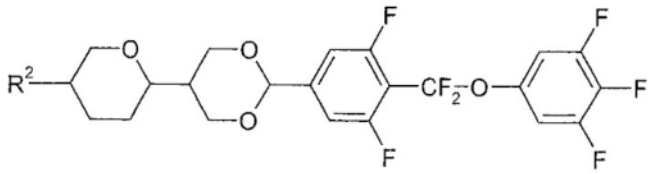
[Chemical Formula 7]



II-1a-1

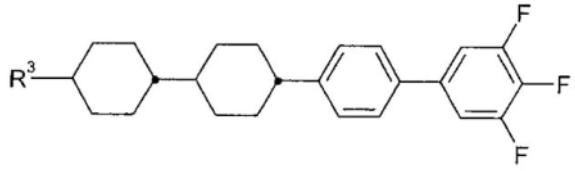


II-1c-1

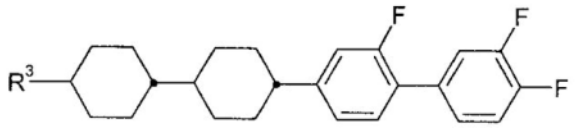


II-1d-1

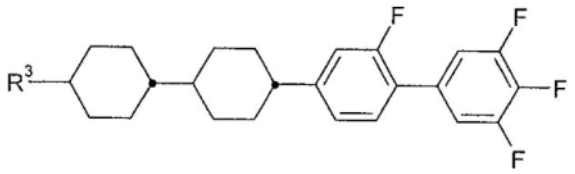
where R2 has a meaning as provided above.
[Chemical Formula 20]



III-2g-1



III-2g-2



III-2g-3

where R3 has a meaning as provided above."

(3) Comparison between the present invention and the invention of the Earlier Application

The Invention and the invention of the Earlier Application are compared.

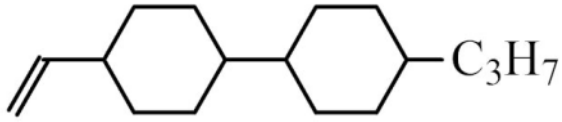
"Nematic liquid crystal medium" of the invention of the Earlier Application corresponds to "nematic liquid crystal composition" of the present invention.

Further, "the component A" of an invention of the Earlier Application corresponds to "a first component" of the present invention, and the concentration of the component A is predetermined as an allegedly most preferable range of 35% to 60%.

Consequently, the present invention and the Earlier Application invention have the following point in common:

"A nematic liquid crystal composition comprising as a first component 30 to 65% of a compound represented by the structural formula (1):

[Chemical Formula 1]



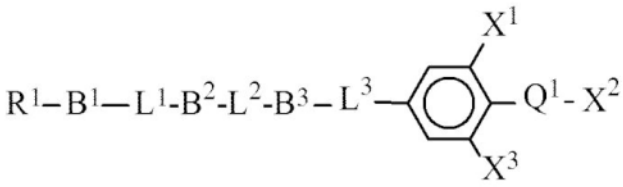
(1)

."

Further, these inventions are different from each other in the following points:

*Different Feature 1: The present invention comprises three or more kinds of compounds selected from the group of compounds represented by the following general formula (2) as a second component, whereas an invention of the Earlier Application fails to specify as such.

[Chemical Formula 2]



(2)

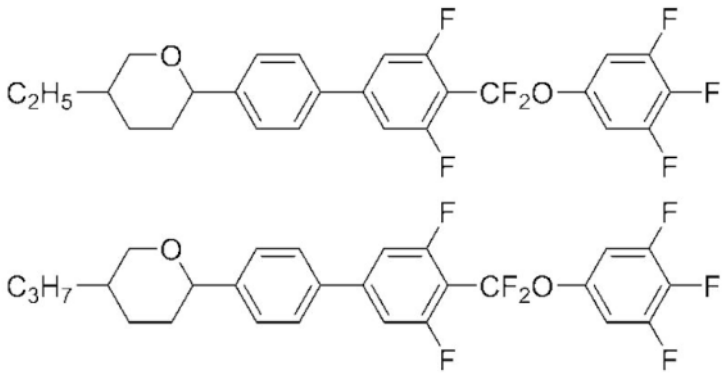
(where R1 is an alkyl group with a carbon number of 1 to 15 or an alkenyl group with a carbon number of 2 to 15, and B1, B2, and B3 are groups, independently from each other, selected from the group consisting of (a) trans-1,4-cyclohexylene group (one CH2 group or two or more nonadjacent CH2 groups present in this group may be replaced with -O-) (b) 1,4-phenylene group (one CH2 group or two or more nonadjacent CH2 groups present in this group may be replaced with -N-), and the above group (a) and group (b) may be replaced with CH3 or halogen,

each of L1, L2, L3 represents, independently from each other, a single bond, -CH2CH2-, -(CH2)4-, -COO-, -OCH2-, -CH2O-, -OCF2-, -CF2O- or -C≡C-,

Q1 is -OCH2-, -OCF2-, OCHF-, -CF2-, or a single bond. X1 to X3 are, independently from each other, H, F, or Cl.)

Different Feature 2: The present invention specifies excluding a liquid crystal medium containing the following compound, whereas an invention of the Earlier Application fails to specify as such.

[Chemical Formula 3]



(4) Examination on the Different Features

A Regarding the Different Feature 1

The compounds represented by the formulae II-1a-1, II-1c-1, and II-1d-1 and the formulae III-2g-1 to III-2g-3, which are allegedly preferable as the "component B" of an invention of the Earlier Application, fall within the compound represented by general formula (2), which is "a second component" of the present invention. Thus "the component B" of the invention of the Earlier Application may encompass compounds falling within "a second component" of the present invention as preferable compounds.

Further, an invention of the Earlier Application includes one kind or two or more kinds of compounds represented by the formulae II-1a-1, II-1c-1, and II-1d-1, and the formulae III-2g-1 to III-2g-3. Thus it also encompasses the case where three or more kinds of the compounds are included. Actually, in the specific example (see Example 14 of the above (1)F.) described in the specification of the Earlier Application, three kinds of compounds ("APUQU-2-F", "APUQU-3-F", "CCGU-3-F") falling within the compounds represented by the formulae II-1a-1, II-1c-1, and II-1d-1, and the formulae III-2g-1 to III-2g-3 are used.

Consequently, it can be said that "the component B" of the invention of the Earlier Application primarily comprises three or more kinds of compounds represented by the above general formula (2), which are "second components" of the present invention. Therefore, it cannot be said that the above Different Feature 1 is substantial.

B Regarding the Different Feature 2

The specific examples described in the above specification, etc. of the Earlier Application include "APUQU-2-F" and "APUQU-3-F", which correspond to the compounds of [Chemical formula 3] excluded in the present invention. Thus the specific examples themselves do not fall within the present invention. However, as aforementioned, it is reasonable to understand that the invention of the Earlier Application preliminarily assumes the case where three or more kinds of the compounds represented by the formulae II-1a-1, II-1c-1, and II-1d-1 and the formulae III-2g-1 to III-2g-3 are included. Further, the above "APUQU-2-F" and "APUQU-3-F" are not essential compounds (in fact, paragraph [0093][Table 3], [0095][Table 5], [0097][Table 7], [0099][Table 9], [0102][Table 12], [0108][Table 13] of the specification, etc. of the Earlier Application describe a number of examples in which these compounds are not used). Therefore, even if the specific examples should not fall within the present invention, it is not inferred that the invention of the Earlier Application excludes the case where three or more kinds of the compounds represented by the formula II-1a-1, II-1c-1, and II-1d-1 and the formula III-2g-1 to III-2g-3 are included.

Consequently, it is reasonable to understand that the invention of the Earlier

Application primarily comprises three or more kinds of compounds selected from compounds represented by the formulae II-1a-1, II-1c-1, and II-1d-1 and the formulae III-2g-1 to III-2g-3 other than "APUQU-2-F" and "APUQU-3-F." Thus it cannot be said that the above Different Feature 2 is substantial.

C The present invention excludes the compounds of [Chemical formula 3] as examined in the above Different Feature 2, which belong to the compounds represented by the general formula (2) as examined in the above Different Feature 1. Therefore, the technical future of the present invention according to Different Features 1 and 2 is, in a word, to comprise three or more kinds of compounds other than the compound of [Chemical formula 3] as the "second component" of the present invention selected from compounds represented by the general formula (2). In view of the significance of the effects caused by the selection, the above Different Features 1 and 2 cannot be recognized as substantial.

The reason is set forth below.

Looking into the specification of the present application with the focus on the effects, there is no explicit description of the effects in a part other than [Examples] of the specification of the present application.

On the other hand, the [Examples] describe the compositions of Examples 1 to 3 of [Table 1] and Comparative Examples 1 to 3 of [Table 2] as specific examples of nematic liquid crystal composition mixed by the above selection, and show the properties of these specific examples (the above "desired properties"). However, as per the consideration in the above "1 Judgment by the body about the support requirement", it cannot even be said that the effects seen from the properties of the specific examples ("desired properties") rely only on the first component and the second component of the present invention. Should the second component have a great impact on the properties ("desired properties"), the effects seen from it should be limited to the ones caused by an embodiment of using three specific kinds of compounds used in the specific examples ("2-Cy-Cy-Ph-Ph1-F", "3-Cy-Cy-Ph-Ph1-F", and "4-Cy-Cy-Ph-Ph1-F") in specific mixing amounts, or an embodiment where it is obvious from the common general knowledge that an equivalent efficacy would be exhibited. Therefore, even if the effects caused by the above selection should be exhibited as the effects that could be seen from the properties of the above specific examples ("desired properties"), this cannot be accepted as the effects of the whole nematic liquid crystal composition of the present invention.

Furthermore, even if the effects caused by the above selection should be to provide a liquid crystal composition for an active matrix-type liquid crystal display device having a broad temperature range of liquid crystal phase and a low viscosity, as described in paragraph [0009] of the specification of the present application, it is reasonable to find that such effects (which can be said as a purpose or a problem of the selection) are construed as the same as those of the invention of the Earlier Application (according to the description of the above (1)C etc. of the specification, etc. of the Earlier Application, it can be seen that the invention of the Earlier Application also has a problem to be solved by the invention of a broad range of nematic phase and low viscosity). Therefore, the effects are not particularly significant.

Considering the above points in combination, in view of the significance of the effects caused by the selection, the above Different Features 1 and 2 cannot be recognized as substantial.

D As in the foregoing consideration, the above Different Features 1 and 2 are only different features in formality, and cannot be said to be substantial. Thus the present invention is identical to the invention of the Earlier Application, thus not patentable under the provision of Article 29bis of the Patent Act.

No. 5 Closing

As described above, the present application violates the provision of Article 36(6)(i) and Article 29bis of the Patent Act, and thus should be rejected.

Therefore, the appeal decision shall be made as described in the conclusion.

October 22, 2018

Chief administrative judge: FUJI, Yoshihiro
Administrative judge: HIBINO, Takaharu
Administrative judge: HARA, Kenichi