



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
03.10.2018 Bulletin 2018/40

(21) Application number: **17190771.0**

(22) Date of filing: **13.09.2017**

(51) Int Cl.:
C11D 3/00 (2006.01) **C11D 3/37** (2006.01)
C11D 1/04 (2006.01) **C11D 1/24** (2006.01)
C11D 1/29 (2006.01) **C11D 1/72** (2006.01)
C11D 1/14 (2006.01) **C11D 1/34** (2006.01)
C11D 1/66 (2006.01) **C11D 3/20** (2006.01)
C11D 3/18 (2006.01)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **31.03.2017 TW 106111144**

(71) Applicant: **Pegavision Corporation**
Taoyuan City 333 (TW)

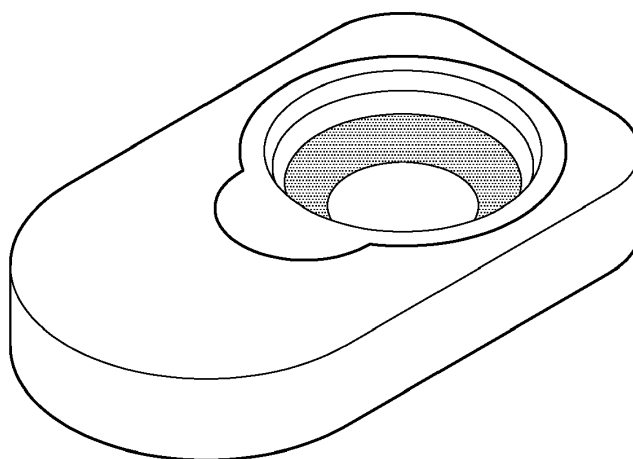
(72) Inventors:
• **CHANG, Han-Yi**
New Taipei City 235 (TW)
• **CHEN, Li-Ju**
Taipei City 105 (TW)

(74) Representative: **Viering, Jentschura & Partner mbB**
Patent- und Rechtsanwälte
Kennedydamm 55 / Roßstrasse
40476 Düsseldorf (DE)

(54) **COMPOSITION FOR CONTACT LENS**

(57) The present invention provides a composition for contact lenses. The composition includes an algefa-cient and a surfactant, wherein the surfactant includes one or a combination of sodium lauroyl lactylate, polyox-

yethylene laureth sulfate, polyoxyethylene hardened castor oil, polyvinylpyrrolidone (PVP), sodium dodecyl sulfate (SDS), TWEEN 80™ and GEROPON™ SB-FA-30.



4 X

Fig.1

Description**BACKGROUND OF THE INVENTION**

1. Field of the Invention

[0001] The instant disclosure relates to a composition for contact lenses; in particular, to a composition for contact lenses which can serve as a contact lens preservation solution.

2. Description of Related Art

[0002] Smartphones and computers are used frequently in today's information society, resulting in an increase in the population with myopia and a decrease in the age group of myopia. In consideration of user convenience and aesthetics, it is generally a good choice for people with myopia to wear contact lenses. However, most people with myopia need to wear contact lenses for extended periods of time. Although the material of the conventional contact lenses have been constantly improved to meet various requirements such as high water content and high oxygen permeability, the wearers thereof would still suffer from eye dryness due to decreased water content and experience eye discomfort due to dirt or secretion. Therefore, there is an urgent need for a maintenance solution that can be used to clean, rehydrate and preserve contact lenses.

SUMMARY OF THE INVENTION

[0003] One aspect of the instant disclosure relates to a composition for contact lens which allows a contact lens wearer's eyes to feel comfortable during the period of initial wear and extended periods of continuous wear.

[0004] According to one of the embodiments of the instant disclosure, the composition for contact lenses includes an algefacient and a surfactant, wherein the surfactant includes one or a combination of sodium lauroyl lactylate, polyoxyethylene laureth sulfate, polyoxyethylene hardened castor oil, polyvinylpyrrolidone (PVP), sodium dodecyl sulfate (SDS), TWEEN 80™ and GEROPON™ SBFA-30.

[0005] Based on the above, by cooperatively using the algefacient and the surfactant, wherein the surfactant includes one or a combination of sodium lauroyl lactylate, polyoxyethylene laureth sulfate, polyoxyethylene hardened castor oil, polyvinylpyrrolidone (PVP), sodium dodecyl sulfate (SDS), TWEEN 80™ and GEROPON™ SBFA-30, the expression of the algefacient in the composition of a contact lens can be performed effectively. Therefore, the discomfort and foreign matter sensation in the eyes of contact lens wearers can be reduced or relieved, providing long-lasting cool and moist sensations to the eyes.

[0006] In order to further appreciate the characteristics and technical contents of the instant disclosure, references are hereunder made to the detailed descriptions and appended drawings in connection with the instant disclosure. However, the appended drawings are merely shown for exemplary purposes, rather than being used to restrict the scope of the instant disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] Fig. 1 is a perspective view showing a contact lens and a composition for contact lenses according to the instant disclosure in a container.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0008] The aforementioned illustrations and following detailed descriptions are exemplary for the purpose of further explaining the scope of the instant disclosure. Other objectives and advantages related to the instant disclosure will be illustrated in the subsequent descriptions and appended drawings.

[0009] Referring to FIG. 1, the instant disclosure provides a composition for contact lenses which can serve as a preservation solution and be hermetically sealed with the contact lenses in a container. In practice, the contact lenses are immersed in direct contact with the composition. When the user wishes to wear the contact lenses, the user takes the contact lens out of the composition and put the contact lenses on his/her eyes. More specifically, the ingredients of the composition absorb onto the surface of the contact lenses and then transfer into the user's eyes.

[0010] The composition according to the instant embodiment is intended for use in connection with soft and rigid contact lenses. The term "soft contact lens" can refer to a hydrous soft contact lens made from hydrogels (i.e., hydrogel contact lenses) and a non-hydrous soft contact lens made from copolymers of butyl acrylate and butyl methacrylate. Furthermore, the composition according to the instant embodiment is applicable to the soft contact lenses in U.S. FDA

category Group I-IV. Group I-IV lenses often contain materials identified in the market as: alphafilcon, asmoafilcon, balafilcon, ethafilcon, hefilcon, hilafilcon, lidofilcon, lotrafilcon, methafilcon, nelfilcon, ocufilcon, omafilcon, phemfilcon, polymacon, tefilcon, tetrafilcon, vasurfilcon, vifilcon, senofilcon, galyfilcon, enfilcon, comfilcon, narafilcon, delefilcon, efrofilcon, and filcon II 3.

[0011] The composition according to the instant embodiment mainly includes a base solution, an algefacient, a surfactant, and a water soluble polymer. The algefacient, the surfactant, and the water soluble polymer are uniformly dispersed in the base solution.

[0012] In the instant embodiment, the base solution is a physiological saline solution with a buffer containing boric acid or phosphorous acid. The buffer has a pH buffering capacity and is configured to adjust the pH of the composition to a pH between 6.8 and 7.6. In addition, the base solution can include an appropriate amount of sodium chloride or potassium chloride to maintain the osmolality of the composition at a value between 250 Osmol/Kg and 350 Osmol/Kg.

[0013] The buffer can be selected from boric acid, borate (e.g., sodium tetraborate), phosphorous acid, or phosphate (e.g., sodium hydrogen phosphate and sodium dihydrogen phosphate). It should be noted that a buffer may be used alone or two or more different buffers may be used in combination in the base solution. In addition, the concentration of the buffer may be appropriately adjusted depending on its kind or the kind of the other ingredients.

[0014] The algefacient is added to reduce or relieve the discomfort and foreign matter sensation in the eyes and give the eyes a cool, fresh sensation. The algefacient includes one or a combination of menthol, camphor, borneol, menthyl lactate, menthone glycerol ketal, monomethyl succinate, and p-menthane-3,8-diol. The content of the algefacient is in the range between 0.001% (w/v) and 0.5 % (w/v), preferably between 0.001% (w/v) and 0.25 % (w/v), to avoid irritating the eye.

[0015] The surfactant is added to clean and moisturize a contact lens, in which protein and lipid deposits on the surfaces of the contact lens can be removed. The surfactant includes one or a combination of sodium lauroyl lactylate, polyoxyethylene laureth sulfate, polyoxyethylene hardened castor oil, polyvinylpyrrolidone (PVP), sodium dodecyl sulfate (SDS), TWEEN 80™ and GEROPONT™ SBFA-30. The content of the surfactant is in the range between 0.001% (w/v) and 2% (w/v), and preferably between 0.001% (w/v) and 0.5 % (w/v).

[0016] It should be noted that by cooperatively using the algefacient and the surfactant, the expression of the algefacient in the composition for contact lenses can be performed effectively. Therefore, eye related symptoms such as eye fatigue, eye dryness, eye pruritus, and eye pain can be reduced or relieved, and a cool fresh sensation in the eyes can be maintained for a long period of time.

[0017] The water soluble polymer is added to moisten and lubricate the eyes, and also helps to keep the ingredients beneficial to the eyes in contact with the contact lens. For example, if the composition for contact lenses includes one or more vitamins (e.g., A, B and E), the vitamin(s) can be attached to the surface of the contact lens by interacting with the water soluble polymer. The water soluble polymer includes one or a combination of polyethylene glycol 400 (PEG 400), methacryloyloxyethyl phosphorylcholine (MPC), and hyaluronic acid. Exemplarily, the water soluble polymer includes PEG 400 and MPC in a molar ratio of 1:20. The content of the water soluble polymer is in the range between 0.05% (w/v) and 5% (w/v).

[0018] Examples 1-5 and Comparative Examples 1-2 are shown in Table 1. Each of the compositions obtained respectively in Examples 1-5 and Comparative Examples 1-2 was used in full contact with the contact lenses. The contact lenses were then put on the user's eyes, and a VAS (Visual analogue scale) method was used to evaluate the sensations of lubrication, comfort, coolness, and moisture in the eyes during the period of initial wear (time 1) and after wearing for 30 minutes (time 2) and 60 minutes (time 3). The evaluation results of for the Examples 1-5 and the Comparative Examples 1-2 are shown in Table 2. Scores for each of the items, as shown in Table 2, are average scores calculated from three users (i.e., six eyes).

Table 1

	unit: g						
	Examples					Comparative ex	
	1	2	3	4	5	1	2
water	2000	2000	2000	2000	2000	2000	2000
sodium chloride	10-20	10-20	10-20	10-20	10-20	10-20	10-20
boric acid	8-16	8-16	8-16	8-16	8-16	8-16	8-16
sodium tetraborate	0.5-4.5	0.5-4.5	0.5-4.5	0.5-4.5	0.5-4.5	0.5-4.5	0.5-4.5
TWEEN 80™	0.01-5	0.01-5	-	0.01-5	0.01-5	-	-

(continued)

	unit: g						
	Examples					Comparative ex	
	1	2	3	4	5	1	2
PVP	0.01-5	0.01-5	0.01-5	0	0.01-5	-	-
GEROPON™ SBFA-30	0	0.01-5	0.01-5	0	0.01-5	-	-
polyoxyethylene hardened castor oil	-	-	-	0.01-2.5	0.01-2.5	-	-
Hyaluronic acid (HA)	0-50	0-50	0-50	0-50	0-50	-	0-50
PEG400	0-50	0-50	0-50	0-50	0-50	-	0-50
MPC	0-50	0-50	0-50	0-50	0-50	-	0-50
menthol	0-4	0-4	0-4	0-4	0-4	-	0-4
camphor	0-4	0-4	0-4	0-4	0-4	-	0-4
borneol	0-4	0-4	0-4	0-4	0-4	-	0-4
menthyl lactate	0-4	0-4	0-4	0-4	0-4	-	0-4
menthone-glycerol ketal	0-4	0-4	0-4	0-4	0-4	-	0-4
monomethyl succinate	0-4	0-4	0-4	0-4	0-4	-	0-4
p-menthane-3,8-diol	0-4	0-4	0-4	0-4	0-4	-	0-4

Table 2

evaluation items	wear-in time	self-feeling score	
		Examples	Comparative ex
lubrication sensation	immediately right after	7	8
	after 30 minutes	7	8
	after 60 minutes	6	8
comfort sensation	immediately right after	7	8
	after 30 minutes	7	8
	after 60 minutes	7	8
coolness sensation	immediately right after	NA	9
	after 30 minutes	NA	6
	after 60 minutes	NA	4
moisture sensation	immediately right after	8	10
	after 30 minutes	8	9
	after 60 minutes	8	9

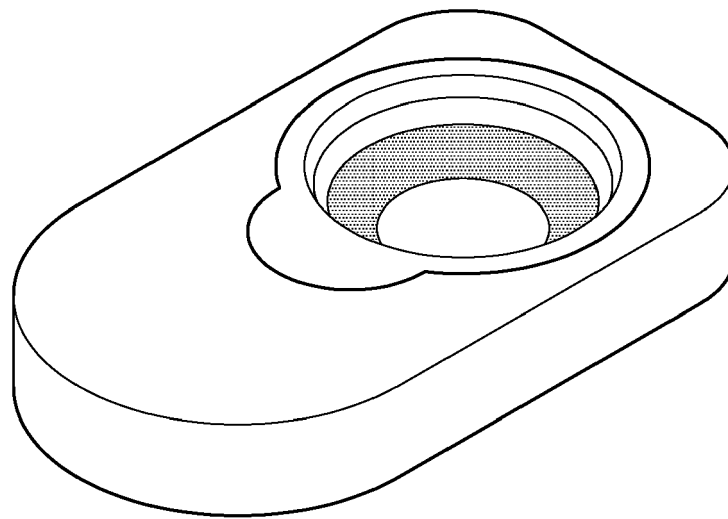
[0019] The composition for contact lenses in which the algeficient and the surfactant are cooperatively used and the surfactant includes one or a combination of sodium lauroyl lactylate, polyoxyethylene laureth sulfate, polyoxyethylene hardened castor oil, polyvinylpyrrolidone (PVP), sodium dodecyl sulfate (SDS), TWEEN 80™ and GEROPON™ SBFA-30. Accordingly, the expression of the algeficient can be performed effectively, so that the discomfort and foreign matter sensation in the eyes of contact lens wearers can be reduced or relieved, and long-lasting cool and moist sensations can be provided to the eyes.

[0020] The descriptions illustrated *supra* set forth simply the preferred embodiments of the instant disclosure; however, the characteristics of the instant disclosure are by no means restricted thereto. All changes, alternations, or modifications

conveniently considered by those skilled in the art are deemed to be encompassed within the scope of the instant disclosure delineated by the following claims.

Claims

1. A composition for contact lenses which includes an algefacient and a surfactant, wherein the surfactant includes one or a combination of sodium lauroyl lactylate, polyoxyethylene laureth sulfate, polyoxyethylene hardened castor oil, polyvinylpyrrolidone (PVP), sodium dodecyl sulfate (SDS), TWEEN 80™ and GEROPON™ SBFA-30.
2. The composition for contact lens according to claim 1, wherein the content of the surfactant is in the range between 0.001% (w/v) and 0.5% (w/v).
3. The composition for contact lens according to claim 1, wherein the algefacient includes one or a combination of menthol, camphor, borneol, menthyl lactate, menthone glycerol ketal, monomethyl succinate, and p-menthane-3,8-diol.
4. The composition for contact lens according to claim 3, wherein the algefacient is menthol.
5. The composition for contact lens according to claim 3 or 4, wherein the content of the algefacient is in the range between 0.001% (w/v) and 0.25 % (w/v).
6. The composition for contact lens according to claim 1, further including a water soluble polymer, wherein the water soluble polymer includes one or a combination of polyethylene glycol 400 (PEG 400), methacryloyloxyethyl phosphorylcholine (MPC), and hyaluronic acid.
7. The composition for contact lens according to claim 6, wherein the water soluble polymer includes PEG 400 and MPC in a molar ratio of 1:20.
8. The composition for contact lens according to claim 6 or 7, wherein the content of the water soluble polymer is in the range between 0.05% (w/v) and 5% (w/v).
9. The composition for contact lens according to claim 1, further including a buffer, wherein the buffer includes boric acid and sodium tetraborate.



' 4 ✖ ✕

Fig.1



EUROPEAN SEARCH REPORT

 Application Number
 EP 17 19 0771

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2017/056335 A1 (ITOH MASASHI [JP] ET AL) 2 March 2017 (2017-03-02)	1-5,8,9	INV.
Y	* paragraphs [0001] - [0013], [0023] - [0025], [0056], [0062], [0063], [0073]; examples *	3,6	C11D3/00 C11D3/37 C11D1/04 C11D1/24 C11D1/29
X	WO 96/03158 A1 (ALCON LAB INC [US]) 8 February 1996 (1996-02-08)	1,2,8,9	C11D1/72 C11D1/14
Y	* page 1, paragraph 1 * * page 2, paragraph 2 * * page 5, paragraph 2; example 1 *	3-6	C11D1/34 C11D1/66 C11D3/20 C11D3/18
X	US 6 228 323 B1 (ASGHARIAN BAHRAM [US] ET AL) 8 May 2001 (2001-05-08)	1,2,6,8,9	
Y	* column 1, lines 12-19 * * column 4, lines 15-52 * * column 6, lines 14-27 * * column 9, lines 18-28; example 5 *	3-6	
Y	US 2017/087199 A1 (PATRON ANDREW P [US] ET AL) 30 March 2017 (2017-03-30)	3	
	* paragraphs [0002] - [0004] * * page 36, left-hand column, lines 21-23 * * page 30, right-hand column, lines 1, 7, 8, 13, 35 * * paragraph [0044] * * page 64, right-hand column, lines 23-28 * * paragraph [0166] *		TECHNICAL FIELDS SEARCHED (IPC) C11D
Y	US 2008/095754 A1 (BURKE SUSAN E [US] ET AL) 24 April 2008 (2008-04-24)	6	
A	* paragraphs [0030], [0031], [0077] *	7	
----- -/-			
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 6 April 2018	Examiner Marttin, Emmeline
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 17 19 0771

5

10

15

20

25

30

35

40

45

2

50

55

EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
T	Anonymous: "Algefacient definition of algefacient by Medical dictionary", Medical dictionary, 6 April 2018 (2018-04-06), pages 1-2, XP055465196, Retrieved from the Internet: URL:https://medical-dictionary.thefreedictionary.com/algefacient [retrieved on 2018-04-06] -----		
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 6 April 2018	Examiner Marttin, Emmeline
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	



Application Number

EP 17 19 0771

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-9(partially)

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



LACK OF UNITY OF INVENTION
SHEET B

Application Number

EP 17 19 0771

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-9(partially)

A composition for contact lenses which includes an algefacient and a surfactant, wherein the surfactant includes one or a combination of sodium lauroyl lactylate, TWEEN 80TM and GEROPONTM SBFA-30.

2. claims: 1-9(partially)

A composition for contact lenses which includes an algefacient and a surfactant, wherein the surfactant includes polyoxyethylene laureth sulfate.

3. claims: 1-9(partially)

A composition for contact lenses which includes an algefacient and a surfactant, wherein the surfactant includes polyoxyethylene hardened castor oil.

4. claims: 1-9(partially)

A composition for contact lenses which includes an algefacient and a surfactant, wherein the surfactant includes polyvinylpyrrolidone.

5. claims: 1-9(partially)

A composition for contact lenses which includes an algefacient and a surfactant, wherein the surfactant includes sodium dodecyl sulfate.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 17 19 0771

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

06-04-2018

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2017056335 A1	02-03-2017	CN 106163565 A	23-11-2016
		US 2017056335 A1	02-03-2017

WO 9603158 A1	08-02-1996	AU 3070395 A	22-02-1996
		US 5741817 A	21-04-1998
		WO 9603158 A1	08-02-1996

US 6228323 B1	08-05-2001	AU 4574999 A	21-03-2000
		US 6228323 B1	08-05-2001
		WO 0012664 A1	09-03-2000

US 2017087199 A1	30-03-2017	NONE	

US 2008095754 A1	24-04-2008	CA 2675500 A1	24-04-2008
		EP 2073800 A2	01-07-2009
		US 2008095754 A1	24-04-2008
		WO 2008049043 A2	24-04-2008

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82