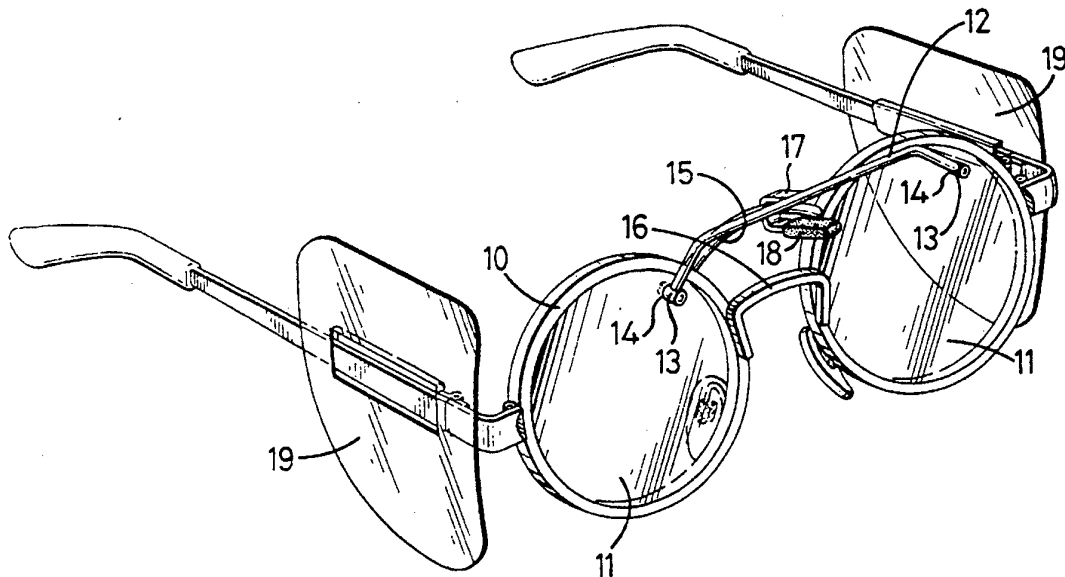




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(54) Title: SUNGLASSES



(57) Abstract

Sunglasses for use by fishermen comprise a spectacle frame (10) with two lens elements (11) of light polarising material journaled therein for rotation about their respective optical axis. A bar (12) couples the two lenses (11) together, being spigotted into a hole (14) in the respective lens (11) at either end. The spectacle frame (10) has an arcuate bridge (15) above the usual bridge piece (16). A hook element (17) is fixed to the bar (12) and extends under, up and around the arcuate bridge piece (15) which serves as a guide rail for it. The wearer engages the hook element (17) with his finger to move it along the guide rail whereby to adjust the angular orientation of the lenses.

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SUNGLASSES

DESCRIPTION

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This invention relates to sunglasses having lenses formed of a light polarising material. Such sunglasses are useful to fishermen who want to see fish below the surface of water as they are capable of cutting out the plane polarised component of sun light reflected by the surface of the water.

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Conventional light polarising sunglasses are not an ideal solution for fishermen to the problem of reflected sunlight because the angle of the sun relative to the surface of the water changes up to about 11 am and from about 3 pm to sunset. The rate of change is at its greatest near to dawn or dusk which are often favourable times of day for fishing. Hence the fisherman is forced to reposition himself every few minutes in order to reorientate the lenses of his glasses so that the plane polarised component of the reflected light continues to be cut out by them.

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GB-A-2204709 describes and illustrates polarised sunglasses comprising a frame in which one pair of lenses of polarising material, one for each eye, are fixedly mounted and another pair of lenses of polarising material are mounted each overlying a respective one of the lenses of said one pair with a space therebetween, for rotation in unison within the frame without substantially altering the spacing of each of the lenses of the other pair from the lens of said one pair that it overlies.

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Means are provided for effecting angular movement in unison of the lenses of said other pair relative to the lenses of said one pair and the frame whereby to attenuate the intensity of the ultra-violet range of radiations transmitted by the lenses. GB-A-1542485, GB-A-2228341, GB-A-2240852, US-A-2298058, US-A-2688900, US-A-3958867 and US-A-4386832 both disclose similarly arranged pairs of glasses each comprising one pair of lenses of polarising material each in line with a respective one of another pair of lenses of polarising material which are fixedly mounted in the frame, the lenses of said one pair being rotatable in unison relative to the frame and the fixed pair.

According to this invention there is provided sunglasses for use by fishermen comprising a spectacle frame with one pair of lenses only, each of the pair of lenses being operable to cut out the plane polarised component of light reflected from the surface of water so as to enable the fishermen to see fish below the surface, wherein each of the single pair of lenses is mounted within the frame for rotation substantially about its optical axis, the arrangement being such that the angular orientation of the lenses within the frame can be adjusted to cater for a change in the angle of the rays of the sun.

The pair of glasses described and illustrated by GB-A-1542485 includes a bar which is pinned at either end to a respective one of the moveable pair of lenses whereby limited angular movement of that pair of lenses relative to the other pair of fixed lenses in the same frame is effected by moving the

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bar along its length in one direction or the other.

5 In a preferred embodiment of the present invention,
the single pair of lenses of polarising material
are coupled together by a bar whereby limited
angular movement of the pair of lenses together in
the frame by substantially the same amount and in
the same sense can be imparted to them by the
10 fisherman by moving the bar along its length in
either direction.

15 Preferably the bar carries a hook element between
its ends, the hook element projecting laterally
from the bar and extending around an arcuate bridge
piece portion of the spectacle frame whereby the
arcuate bridge piece serves as a guide rail which
guides or constrains the intermediate portion of
the bar from which the hook portion extends, to
20 follow a pre-set arcuate path similar to that to be
followed by each end of the bar at its coupling to
the respective one of the single pair of lenses of
polarising material as the bar is moved along its
length to effect angular movement of the single
25 pair of lenses in unison within the spectacle
frame. The preferred form of bar is a length of
rod, conveniently of metal, having at either end a
lateral spigot which is spigotted into a respective
hole in the polarising material of the respective
30 lens whereby to form the coupling between the bar
and that lens. Conveniently the hook element
extends from the bar over the arcuate bridge piece
portion and is bent back under that bridge piece
portion, the end part of the hook portion being
35 adapted to be engageable by the fisherman to effect

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adjustment of the angular orientation of the single pair of lenses of polarising material relative to the frame.

5 Conveniently a pair of shield elements are carried by the frame, each depending from a respective one of the pair of arms of the spectacle frame, adjacent the hinge of that arm. Desirably the shield elements are curved so that they follow the
10 perimeter of the adjacent part of the spectacle frame in which a respective one of the single pair of lenses of polarising material is mounted for angular movement. Each of the shield elements may be mounted detachably on the respective arms,
15 conveniently by being provided with spaced aperture means adapted to receive the respective arm so that each shield element can be slid onto the arm into position adjacent the hinge of that arm.

20 One form of sunglasses for use by fishermen in which this invention is embodied is described now by way of example with reference to the accompanying drawing which is a perspective view of the spectacles as seen from the front.

25 The drawing shows a spectacle frame 10 with two lens elements 11 journaled therein for angular rotation about their respective optical axis. Each lens element 11 comprises a lens of light
30 polarising material.

A bar 12 formed of a length of metal rod couples the two lenses 11 together, extending between them in front of the frame 10. The bar 12 carries a
35 spigot 13 at either end, each spigot 13 being

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spigotted into a hole 14 formed directly in the respective lens element 11.

5 The spectacle frame 10 has an arcuate bridge piece 15 above the usual bridge piece 16 that is designed to rest upon the nose of a wearer.

10 A hook element 17 projects laterally from the bar 12 to which it is fixed and extends over, down and around the arcuate bridge piece 15 so that the latter serves as a guiderail which guides it and thereby guides the intermediate portion of the bar 12 to which it is joined, to follow a preset arcuate path similar to that to be followed by the interengaged spigots 13 and holes 14 during angular movement of the lenses 11 together with movement of the bar 12 along its length. The lower end of the hook element projects forwardly, under and beyond the bar 12 forming a finger projection 18 which is adapted to be engaged by a finger of the wearer whereby it can be moved along the guiderail that comprises the arcuate bridge piece 15.

25 A pair of shield elements 19 are carried one on each arm from which they are detachably suspended by being formed with a spaced pair of holes through which the arm can be passed; the portion of the shield element between the pair of holes being deformed relative to the remainder of the shield element 19 so that it is on one side of an arm and the remainder of the shield element from which it is separated by the holes is on the other side of the arm. Conveniently the shield element is curved so that it follows the perimeter of the adjacent

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part of the spectacle frame as it depends from the respective arm.

5 In operation, the fisherman wears the spectacles so that the shields shield his eyes from light from either side. He manipulates the finger engageable portion 18 of the hook element 17 to position it along the arcuate bridge piece 15 to set the lenses 11 so that they are both oriented so that the
10 polarised components of sunlight reflected from the water does not pass through them. Periodically the fisherman is able to adjust the angle of orientation of the lenses 11 by manipulating the upper part 18 of the hook portion 17, as the sun
15 rises or falls so that the polarised component of light reflected from the water continues to be prevented from passing through the lenses 11.

20 The load exerted by the fisherman as he manipulates the finger engageable portion 18 of the hook element 17 is transferred to the arcuate bridge piece 15 from where it is distributed through the frame 10. As a result any tendency for the lenses to bind in the frame 10 that could follow if that
25 load was applied directly to the bar 12 is reduced so that the lenses are more likely to rotate freely in the frame 10.

30 Although each lens is directly mounted within the respective aperture formed by the frame so that the frame provides a bearing surface for the respective lens around the respective aperture, each lens could be mounted in the frame by means of a
35 respective ball race.

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CLAIMS

- 5 1. Sunglasses comprising a spectacle frame with a pair of lenses, each of the pair of lenses being operable to attenuate the plane polarised component of light reflected from the surface of water and being mounted within the frame for rotation substantially about its optical axis, characterised
- 10 in that said pair of lenses is the only pair and said sunglasses are for use by fishermen, each of the pair of lenses being operable to cut out the plane polarized component of light reflected from the surface of water so as to enable the fisherman
- 15 to see fish below the surface, the arrangement being such that the angular orientation of the lenses within the frame can be adjusted to cater for a change in the angle of the rays of the sun.
- 20 2. Sunglasses as claimed in claim 1 wherein the single pair of lenses of polarising material are coupled together by a bar which is coupled at either end to a respective one of the pair of lenses whereby limited angular movement of the pair
- 25 of lenses together in the frame by substantially the same amount and in the same sense can be imparted to them by the fishermen by moving the bar along its length in either direction.
- 30 3. Sunglasses according to claim 2, wherein the bar carries a hook element between its ends, the hook element projecting laterally from the bar and extending around an arcuate bridge piece portion of the spectacle frame whereby the arcuate bridge
- 35 piece portion serves as a guide rail which guides

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or constrains the intermediate portion of the bar from which the hook element extends, to follow a preset arcuate path similar to that to be followed by each end of the bar at its coupling to the
5 respective one of the single pair of lenses of polarising material as the bar is moved along its length to effect angular movement of a single pair of lenses in unison within the spectacle frame.

10 4. Sunglasses according to claim 3 wherein the bar is a length of rod having at either end a lateral spigot which is spigotted into a respective hole in the polarising material of a respective lens whereby to form the coupling between the bar and
15 that lens.

20 5. Sunglasses according to claim 4 wherein the hook element extends from the bar over the arcuate bridge piece portion and is bent back under that bridge piece portion projecting forwards under and beyond the bar, the end part of the hook element forming a finger projection which adapted to be engageable by the fisherman to effect adjustment of the angular orientation of the single pair of
25 lenses of polarising material relative to the frame.

30 6. Sunglasses according to any one of claims 3 to 5, wherein the arcuate bridge piece portion is above the bridge piece that is to rest on the nose of a wearer.

35 7. Sunglasses according to any one of claims 1 to 6 wherein a pair of shield elements are carried by the frame, each depending from a respective one of

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the pair of arms of the spectacle frame, adjacent the hinge of that arm.

5 8. Sunglasses according to claim 7, wherein the shield elements are curved so that they follow the perimeter of the adjacent part of the spectacle frame in which a respective one of a single pair of lenses of polarising material is mounted for angular movement.

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9. Sunglasses according to claim 8 wherein the shield elements are detachable.

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10. Sunglasses according to claim 9 wherein the detachable shield elements are provided with aperture means adapted to receive an arm of the spectacle frame whereby a shield element can be slid onto that arm and positioned adjacent the hinge of that arm so as to depend therefrom.

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AMENDED CLAIMS

[received by the International Bureau on 1 August 1994 (01.08.94);
original claims 1 and 2 deleted; original claims 3-10 amended
and renumbered as claims 1-8 (3 pages)]

5 1. A pair of spectacles comprising a spectacle
frame with a pair of lenses, each of the pair of
lenses being mounted within the frame for rotation
substantially about its optical axis, said pair of
spectacles being for use by fishermen, each of the
10 pair of lenses being of polarised material and
thereby being operable to attenuate and cut out the
plane polarized component of light reflected from
the surface of water so as to enable the fisherman
to see fish below the surface, the arrangement
15 being such that the angular orientation of the
lenses within the frame can be adjusted to cater
for a change in the angle of the rays of the sun,
characterised in that said pair of spectacles are
sunglasses and said pair of lenses are the only
20 pair and are coupled together by a bar
which is coupled at either end to a respective one
of the pair of lenses whereby limited angular
movement of the pair of lenses together in the
frame by substantially the same amount and in the
same sense can be imparted to them by the fishermen
25 by moving the bar along its length in either
direction, and wherein the bar carries a hook
element between its ends, the hook element
projecting laterally from the bar and extending
around an arcuate bridge piece portion of the
30 spectacle frame whereby the arcuate bridge
piece portion serves as a guide rail which guides
or constrains the intermediate portion of the bar
from which the hook element extends, to follow a
preset arcuate path similar to that to be followed

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by each end of the bar at its coupling to the respective one of the single pair of lenses of polarising material as the bar is moved along its length to effect angular movement of a single pair of lenses in unison within the spectacle frame.

2. Sunglasses according to claim 1 wherein the bar is a length of rod having at either end a lateral spigot which is spigotted into a respective hole in the polarising material of a respective lens whereby to form the coupling between the bar and that lens.

3. Sunglasses according to claim 1 or claim 2 wherein the hook element extends from the bar over the arcuate bridge piece portion and is bent back under that bridge piece portion projecting forwards under and beyond the bar, the end part of the hook element forming a finger projection which adapted to be engageable by the fisherman to effect adjustment of the angular orientation of the single pair of lenses of polarising material relative to the frame.

4. Sunglasses according to any one of claims 1 to 3, wherein the arcuate bridge piece portion is above a bridge piece which is to rest on the nose of a wearer.

5. Sunglasses according to any one of claims 1 to 4 wherein a pair of shield elements are carried by the frame, each depending from a respective one of

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the pair of arms of the spectacle frame, adjacent the hinge of that arm.

5 6. Sunglasses according to claim 5, wherein the shield elements are curved so that they follow the perimeter of the adjacent part of the spectacle frame in which a respective one of a single pair of lenses of polarising material is mounted for angular movement.

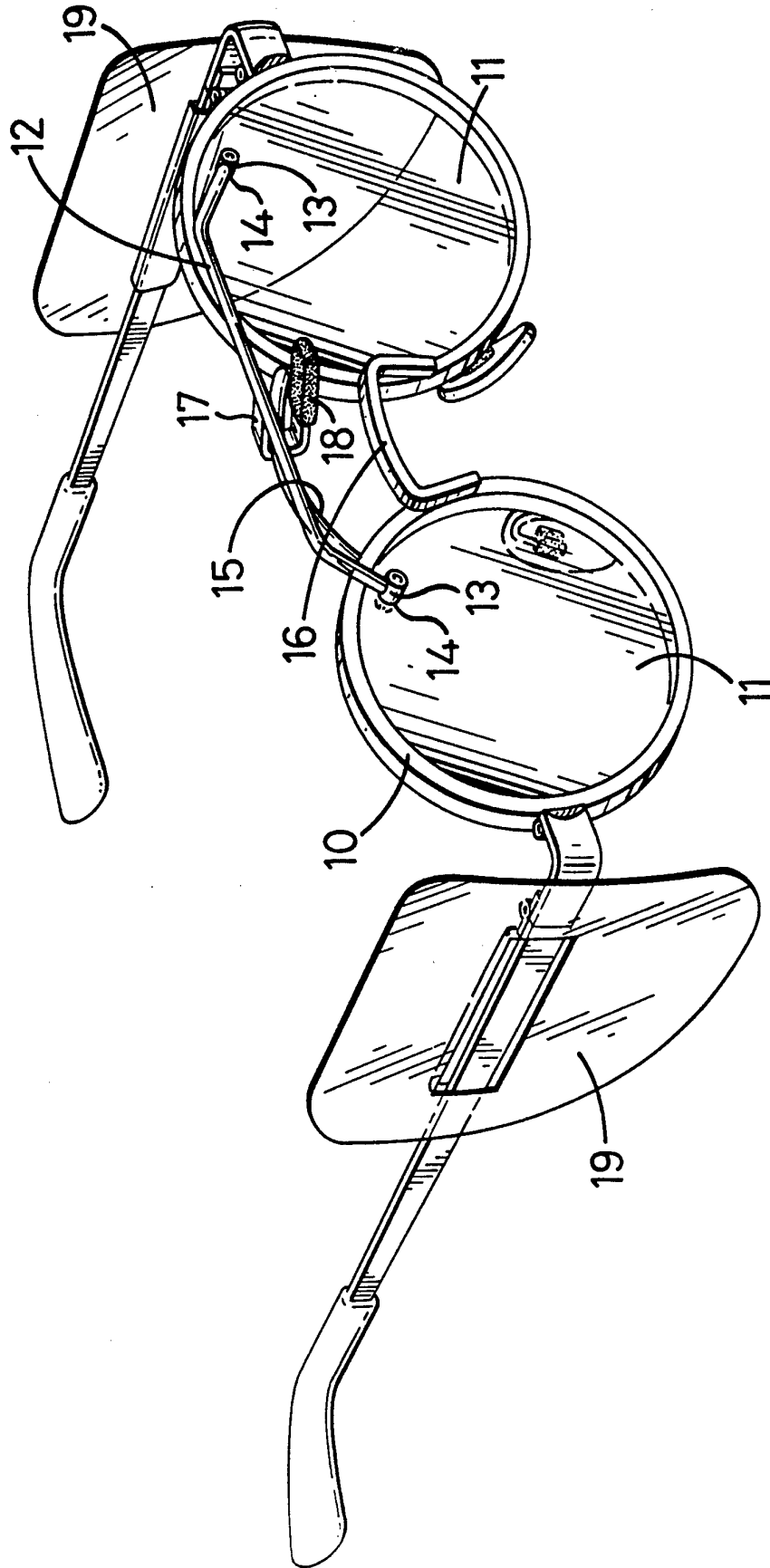
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7. Sunglasses according to claim 6 wherein the shield elements are detachable.

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8. Sunglasses according to claim 7 wherein the detachable shield elements are provided with aperture means adapted to receive an arm of the spectacle frame whereby a shield element can be slid onto that arm and positioned adjacent the hinge of that arm so as to depend therefrom.

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 93/00662

A. CLASSIFICATION OF SUBJECT MATTER

IPC 5 G02C7/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 5 G02C

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| Y | US,A,3 423 149 (H.N. BRAUNHUT) 21 January 1969 see abstract; claims see column 1, line 20 - line 35 --- | 1,5,7 |
| Y | FR,A,1 346 989 (V. DE YARMONKINE) 18 November 1963 see the whole document --- | 1,5,7 |
| X | FR,A,1 264 548 (J.L.M. LEDUC) 15 May 1961 | 2 |
| A | see page 2, line 4 - page 3 --- | 1 |
| A | US,A,3 867 020 (H.N. BRAUNHUT) 18 February 1975 see abstract; claims see column 7, line 11 - line 26 --- | 1 |
| | -/-- | |

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Date of the actual completion of the international search

14 January 1994

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NL - 2280 HV Rijswijk
Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+ 31-70) 340-3016

Authorized officer

CALLEWAERT, H

INTERNATIONAL SEARCH REPORT

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| Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| A | US,A,3 505 679 (R.H. BENNETT) 14 April 1970 see abstract; claims --- | 7-10 |
| A | US,A,4 386 832 (G.NANNINI) 7 June 1983 cited in the application see abstract; claims --- | 1,2 |
| A | GB,A,1 542 485 (POLAROID CORPORATION) 21 March 1979 cited in the application see page 3, line 32 - line 52; claims --- | 1,2 |
| A | GB,A,2 204 709 (C.C. HOLMES) 16 November 1988 cited in the application see abstract; claims ----- | 1,5 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int. .ional Application No

PCT/GB 93/00662

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|--|------------------|-------------------------|------------------|
| US-A-3423149 | 21-01-69 | NONE | |
| FR-A-1346989 | | NONE | |
| FR-A-1264548 | | NONE | |
| US-A-3867020 | 18-02-75 | NONE | |
| US-A-3505679 | 14-04-70 | NONE | |
| US-A-4386832 | 07-06-83 | NONE | |
| GB-A-1542485 | 21-03-79 | NONE | |
| GB-A-2204709 | 16-11-88 | NONE | |