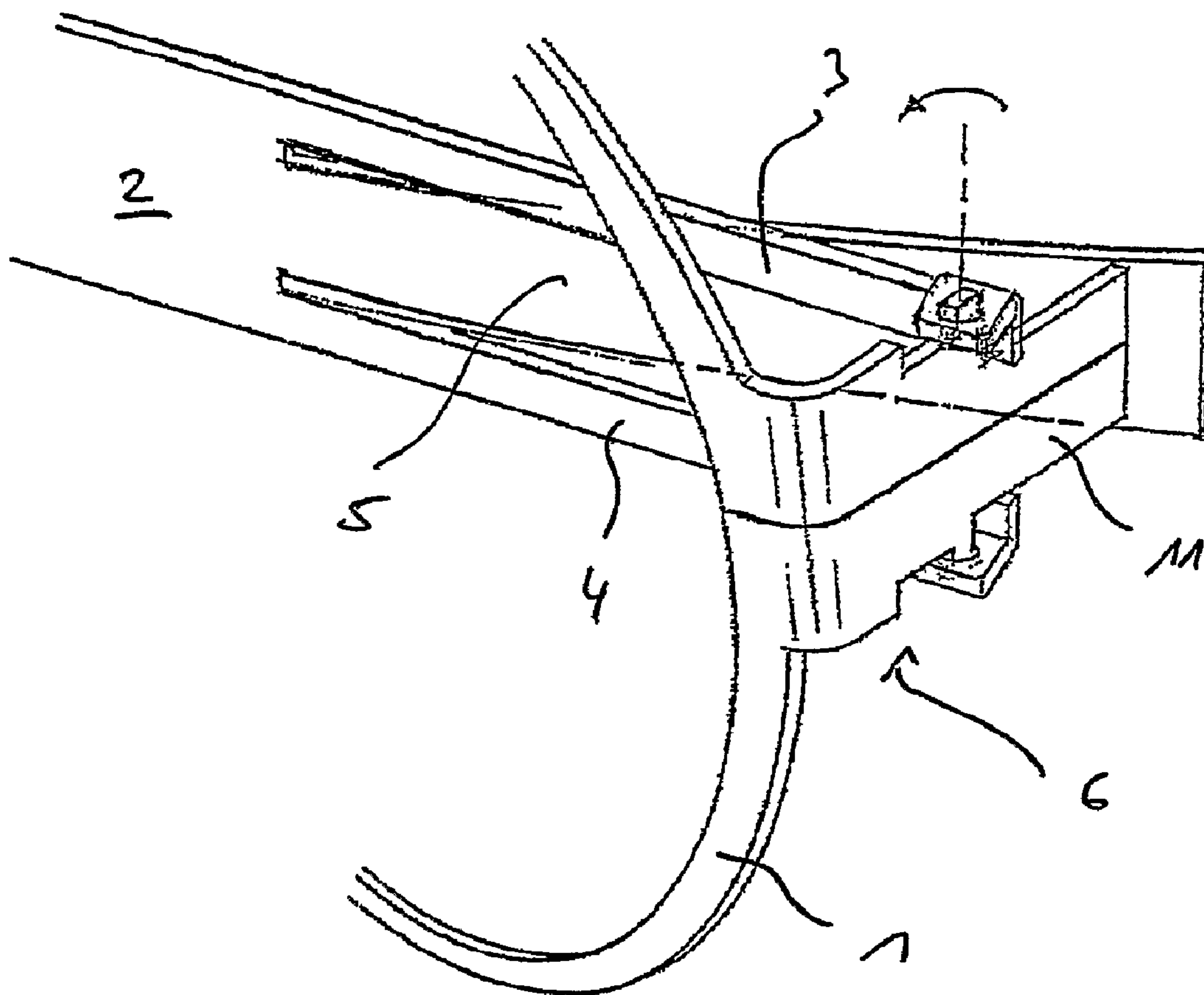




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(57) Abrégé/Abstract:

The invention relates to a spectacle frame with a mount (1) and with one sidepiece (2) each left and right of it hinged to a connecting element (6) of the mount (1). The sidepiece (2), at its mount proximal end, is provided with three leaf springs (3, 4, 5).

(57) **Abrégé(suite)/Abstract(continued):**

The two outer leaf springs (3, 4) comprise hinge elements (10) with which hinge elements (9) of the connecting element (6) interact, thereby forming a hinge. When the sidepiece (2) is folded in, the outer leaf springs (3, 4) of the sidepiece (2) are displaced outward from the plane of the connecting element (6) via a support (11) of the connecting element (6) for the center leaf spring (5) of the sidepiece (2).

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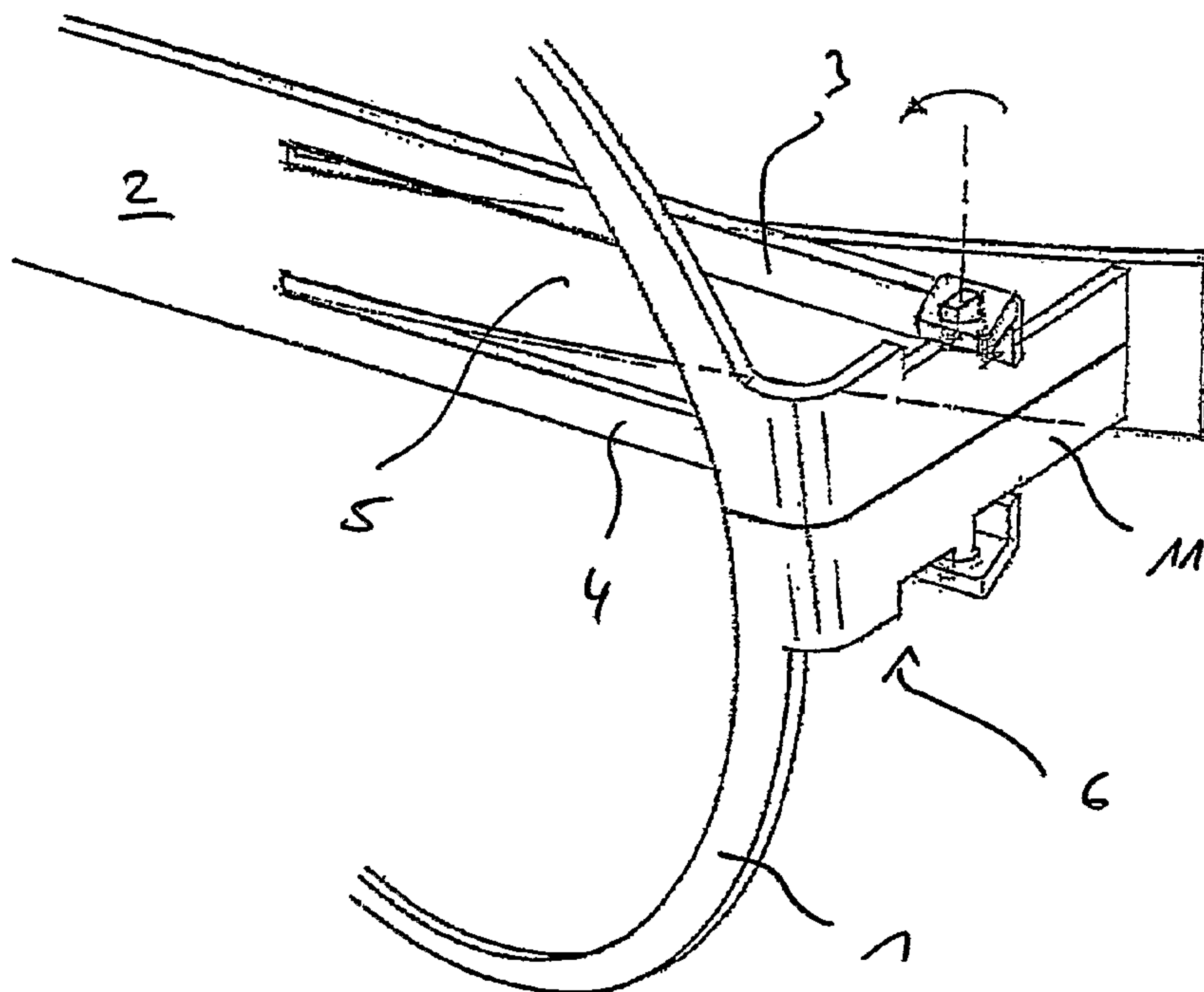
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[Fortsetzung auf der nächsten Seite]

(54) Title: SPECTACLES

(54) Bezeichnung: BRILLE



(57) Abstract: The invention relates to a spectacle frame with a mount (1) and with one sidepiece (2) each left and right of it hinged to a connecting element (6) of the mount (1). The sidepiece (2), at its mount proximal end, is provided with three leaf springs (3, 4, 5). The two outer leaf springs (3, 4) comprise hinge elements (10) with which hinge elements (9) of the connecting element (6) interact, thereby forming a hinge. When the sidepiece (2) is folded in, the outer leaf springs (3, 4) of the sidepiece (2) are displaced outward from the plane of the connecting element (6) via a support (11) of the connecting element (6) for the center leaf spring (5) of the sidepiece (2).

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TZ, UG, ZM, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI Patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

(57) **Zusammenfassung:** Die vorliegende Erfindung betrifft ein Brillengestell mit einer Fassung (1) und mit links und rechts je einem Bügel (2), der an einem Anschlusselement (6) der Fassung (1) gelenkig gelagert ist. Der Bügel (2) weist an seinem fassungsseitigen Ende drei Blattfedern (3,4,5) auf, wobei die beiden äusseren Blattfedern (3,4) Gelenkelemente (10) aufweisen, mit denen Gelenkelemente (9) des Anschlusselements (6) unter Ausbildung eines Drehgelenks zusammenwirken, wobei beim Einklappen des Bügels (2) sich die äusseren Blattfedern (3,4) des Bügels (2) über ein Widerlager (11) des Anschlusselements (6) für die mittlere Blattfeder (5) des Bügels (2) aus der Ebene des Anschlusselements (6) heraus bewegen.

Spectacle Frames

- 5 The present invention relates to glasses or respectively a glasses frame, in which screws for the joint mechanism are not necessary, as well as its components.

10 In the prior art, different types of joint mechanisms for glasses frames are known. The most common type is based on a hinge mechanism in which pins are disposed on the frame or respectively the rim of the lenses which cooperate with a respective hinge which is disposed at the end on the side of the temple which is on the side of the rim by interleaving both parts and by connecting them by means of special screws such that they are pivotable. In most glasses rims, in particular in those which
15 are used with corrective glasses, opening and closing the rims for inserting or for changing the lenses is carried out by means of a so-called closing block. The lenses can also be directly attached to a frame by screwing screws directly into the lens. In glasses without frame, the temples are directly screwed with the lenses by means of a projecting part.

20

Since the swivel joint is subject to high dynamic loads during lifetime of the glasses, in several solutions, no traditional swivel joint is used for reasons of simplification.

Thus, the US patent application no. 3,155,982 proposes glasses in which the temples
25 directly cooperate with the front part of the rim which contains the lenses. Therefore, the end of the temple which is on the side of the rim is divided into three leaf springs, wherein the central leaf spring abuts on the external edge of the rim part, whereas the two external leaf springs engage with openings disposed near the external edge in the central piece by means of hooks formed at their ends. A disadvantage of the
30 joint mechanism described in US 3,155,982 is the fact that the glasses temples are only attached to the rim very loosely such that the glasses temples can be loosened from the holder very easily, e. g. when the glasses fall on the floor.

Another solution for a glasses joint which as well uses a glasses temple which is provided with three leaf springs is proposed in the European patent no. 0 863 424 B1 of Haffmans and Gottschling. On the rim, respectively one connecting element is provided on the left and on the right, which has an upper and a lower recess which
5 forms a joint axis which is perpendicular to the direction of the temple in its folded-out state. In the folded-out state of the temples, the two external leaf springs of the temples engage with the recesses in the connecting element from the surface of the connecting element which is faced to the face of the wearer of the glasses by means of curved shapes which are provided on their free ends and then abut on the surface
10 of the connecting element which is not faced to the face of the wearer of the glasses, whereas the central leaf spring abuts with its entire length on the opposite surface of the connecting element. The connecting element therein is divided in two pieces; thus, it is easily possible to change the lenses. For stabilization, a closing clip can be used which can be pushed over the two-piece connecting element. This mechanism
15 however has the disadvantage that inserting the temples is difficult since the external leaf springs and the central leaf spring have to be guided on opposite surfaces of the connecting element, wherein this operation has to be effected by moving against the resilience and the curved shapes of the ends are disturbing. Furthermore, in particular if the dimensions of this joint are very small, the risk that the temples are
20 detached from the connecting element even in the case of low mechanical load.

From the French publication FR 2 779 241, a glasses frame having a glasses joint is known which is achieved by providing with pins the end of the temple on the side of the rim, which engage with recesses of a connecting element on the rim, wherein
25 clips of the connecting element overlap the end on the side of the rim when the temple is swivelled. Such a joint however does not assure a safe holding of the temple in the case of excessive mechanical load.

The US 3,458,866 describes protective goggles in which the temple has a slit which
30 is substantially vertical, in which a lateral connecting element of the frame is locked such that it is pivotable. The front end of the temple encloses the connecting element. Such design is destined, as typical for protective goggles, to achieve an easy and fast mounting or respectively dismounting of the temple and therefore is not appropriate for optical glasses.

Based on the foregoing, it is the objective of the present invention to provide a glasses frame which makes possible an easy mounting of the temples and in which an unintended detaching of the glasses temples in case of mechanic load of the glasses is prevented.

In one aspect of the present invention there is provided a glasses frame having respectively:

one temple (2) on the left and on the right, and

having a rim (1) which has respectively:

one connecting element (6) on the left and on the right, whose end which is on the side of the temple points in the direction of the temple (2) in the folded-out state,

wherein temples (2) respectively have a first external leaf spring (3), a central leaf spring (5) and a second external leaf spring (4) on their end on the side of the rim, each leaf spring which is substantially coplanar to the connecting element (6) when the temple (2) is folded out; and

first joint elements (9) are disposed on the connecting element (6) which cooperate with second joint elements (10) which are attached to the first and second external leaf springs (3, 4) such that a swivel joint is formed,

characterized in that the connecting element (6), which is designed as a flat surface, tapers in direction of the temple (2) behind the first joint elements (9) to form a tapered section, wherein,

during folding in, the tapered section of the connecting element (6) forms an abutment (11) for the central leaf spring (5) of the respective temple (2).

In another aspect of the present invention, there is provided a glasses frame having respectively:

5 one temple (2) on the left and on the right, and
having a rim (1) which has respectively:

one connecting element (6) on the left and on the right, whose end which is on the side of the temple points in the direction of the temple (2) in the folded-out state,

10

wherein the temples (2) consist of a first external leaf spring (3), a central leaf spring (5) and a second external leaf spring (4) on their end on the side of the rim, each leaf spring having a leaf surface which is substantially coplanar to the connecting element (6) when the temple (2) is folded out,
15 and

15

first joint elements (9) are disposed on the connecting element (6) which cooperate with second joint elements (10) which are attached to the first and second external leaf springs (3, 4), such that a swivel joint is formed,
20 and

20

each connecting element (6) is formed such that an abutment (11) for the central one (5) of the three leaf springs of the respective temple (2) is provided when the temple (2) is folded in,

25

characterized in that the second joint elements (10) at the first and second external leaf springs (3, 4) are disposed relative to the first joint elements (9) of the respective connecting element (6) such that when the respective temple (2) is folded in, the external leaf springs (3, 4) of the temple (2) are
30 being moved over the abutment (11) of the connecting element (6).

30

In another aspect of the present invention, there is provided glasses frame for receiving lenses having connecting elements (6) which are disposed on the left and on the right for attaching a temple (2) such that it is pivotable by means of joint elements (9) which are disposed on the connecting element (6),
5 characterized in that the connecting elements (6) are designed as flat surfaces and respectively extend in direction of the temples (2), wherein the connecting elements (6) taper behind the joint elements (9) in a section, wherein the tapered section serves as an abutment (11) for the temple (2) when the temple (2) is folded in.

10

Advantageous designs of the invention relate from the dependent claims.

15

Thus, the spirit of the invention is the fact that the temples of the glasses frame on their end on the side of the rim have three leaf springs which are substantially parallel in their longitudinal direction, wherein the external ones of the three leaf spring on their ends have joint elements, which are disposed relative to joint elements of the connecting element such that when the temple is folded in, said outer leaf springs are being swivelled over an abutment of the connecting element or respectively are being moved out of the surface plane of the connecting element. The connecting element
20 which is designed as a flat surface therefor is designed according to the invention such that it tapers in direction of the temple behind the joint element, wherein the tapering section forms an abutment for the central one of the three leaf springs of the respective temple when the temple is folded in.

25

Such design has the advantage that all three leaf springs abut on the surface of the connecting element which is not faced to the face of the glasses wearer, such that a common plane end region is formed. Furthermore, the fact that the external leaf springs as well as the central leaf spring abut on the external surface of the connecting element, enables an easy mounting, since the leaf springs do not have to
30 be guided on opposite surfaces of the connecting element.

Although these leaf springs abut on a common surface, the design of the glasses frame according to the invention with joint elements which are being attached to the

external leaf springs enables the formation of a spring mechanism which supports the folding-in or respectively folding-up of the temples.

5 The spring mechanism results from the fact that the central leaf spring is supported on the tapering section of the connecting element which extends in direction of the temple and thus forms the abutment, whereas the external ones of the three leaf springs are provided with the joint elements. Here, the maximum width of the central leaf spring corresponds to the width of the abutment.

10 For forming the swivel joint, the temples on the external leaf springs have joint elements in the form of loops, whereas on the connecting element, corresponding pivot pins are provided. When the temple is mounted, the pivot pins of the connecting element engage with the loops of the leaf springs.

15 In another embodiment, the pivot pins of the connecting element are designed approximately conically, such that they are received in concave opposite bearing shells, which are disposed on the external leaf springs, such that they can be pivoted.

20 The connecting element can be divided on its entire length into an upper bar and in a lower bar. The connecting element is thus divided through the frame to the lenses. Thus, an easy change of the lenses is possible, since in the case of dismounted temples the sides of the rim are easily pulled apart and thus, the glasses can be removed or changed.

25 These bars can possibly be fixed in a flexural resistant connection for achieving an additional stability by means of a sleeve which can be pushed over the connecting element of the respective temple before the temple is attached.

30 In another embodiment of the glasses frame according to the invention, the external leaf springs are designed such that a spring resilience which is substantially applied in direction of the joint axis for holding the joint elements of the external leaf springs and of the connecting element in a pivotable connection in a captivated manner.

Additionally, the resilience which is applied by the external leaf springs results in the fact that the bars are fastened relative to each other and the lenses are fixed in the respective sections of the frame without risk of loss. The leaf springs can easily be pulled apart against their resilience for detaching the temples from the connecting
5 element and for making the rim accessible for changing the lenses.

According to the invention, it is provided that the length of the leaf springs and the length of the abutment are such that on the one hand, the spring resilience is sufficient for achieving a connection of the joint elements of the temple and of the
10 connecting element such that it cannot be detached and on the other hand the leaf spring resilience is sufficient for holding the temple in its folded-out state. Furthermore, in the embodiment in which the connecting element has two bars, the lengths of the respective components are selected such that additionally the resilience is sufficient for holding together the two bars of the connecting element.

15 All components of the glasses frame according to the invention can be fabricated in a preferred embodiment as stampings or blanks made of sheet metal, which subsequently are bent into the desired finished form. The use of titanium as material of the individual elements is also possible.

20 The invention will now be described in further detail with regard to the exemplary embodiments represented in the enclosed drawings. In the drawings,

Fig. 1

25 shows a perspective view of a temple and a rim of the glasses frame according to the invention in the folded-out state of the temple;

Fig. 2 shows a perspective view of the temple and of the rim of the glasses frame according to the invention in the folded-in state of the temple; and

30 Fig. 3 shows a perspective exploded view of one part of the glasses frame according to the invention.

Fig. 1 shows an example of one part of the glasses frame according to the invention.

The glasses frame substantially consists of a rim 1 and a temple 2. The temple 2 has three leaf springs 3, 4, and 5 on its end on the side of the rim which are parallel, that is, two external leaf springs 3 and 4 and a central leaf spring 5.

- 5 The rim 1 has a connecting element 6 on both sides, which extends in direction of the temple 2. The connecting element 6 is divided into an upper bar 7 and a lower bar 8.

As it can be seen in fig. 3, the division of the rim 1 extends to the lenses which are not represented herein. When the temple 2 is dismounted, the rim 1 can be slightly
10 opened laterally by pulling apart the bars 7 and 8 for inserting or respectively changing the lenses.

The upper bar 7 and the lower bar 8 respectively have a pivot pin 9 which are respectively situated one above the other and thus form a pivot axis. In the mounted
15 state, these pivot pins 9 engage with loops 10 which are respectively provided on the external leaf springs 3 and 4.

As it can be seen from fig. 3, the temple 2 is easily attached to the connecting element 6 by pulling apart the external leaf springs 3 and 4 and by inserting the pivot
20 pins 9 in them. Due to the resilience of the external leaf springs 3 and 4 in direction of each other, it is achieved that the loops 10 provide a safe and pivotable locking over the pivot pin 9, whereby additionally the upper bar 7 and the lower bar 8 are fixed with each other in a flexural resistant connection.

- 25 The connecting element 6 has a section behind the pivot pin 9 which tapers in direction of the temple 2 which forms a leaf-shaped abutment 11.

As it can be seen in fig. 1, the central leaf spring 5 in the folded-out state abuts on the surface of the abutment 11 which is not faced to the wearer of the glasses. When the
30 glasses are folded in, as it is shown in the fig. 2, the central leaf spring 5 is supported by the abutment 11 for forming a resilience mechanism.

The abutment 11 has the same width as the central leaf spring 5 and is formed such that the external leaf springs 3 and 4 can be guided over the abutment 11 when the temple 2 is folded in.

**THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:**

1. A glasses frame having respectively:

5 one temple (2) on the left and on the right, and

having a rim (1) which has respectively:

10 one connecting element (6) on the left and on the right, whose end
which is on the side of the temple points in the direction of the temple
(2) in the folded-out state,

15 wherein temples (2) respectively have a first external leaf spring (3), a
central leaf spring (5) and a second external leaf spring (4) on their end
on the side of the rim, each leaf spring which is substantially coplanar to
the connecting element (6) when the temple (2) is folded out; and

20 first joint elements (9) are disposed on the connecting element (6) which
cooperate with second joint elements (10) which are attached to the first
and second external leaf springs (3, 4) such that a swivel joint is formed,

25 characterized in that the connecting element (6), which is designed as a
flat surface, tapers in direction of the temple (2) behind the first joint
elements (9) to form a tapered section, wherein,

 during folding in, the tapered section of the connecting element (6) forms
an abutment (11) for the central leaf spring (5) of the respective temple
(2).

2. The glasses frame according to claim 1, in which the second joint elements (10) on the first and second external leaf springs (3,4) are disposed relative to the first joint elements (9) of the respective connecting element (6) such that when the respective temple (2) is folded in, the external leaf springs (3, 4) of the temple (2) are moving over the abutment (11) of the connecting element (6).
3. A glasses frame having respectively:
- one temple (2) on the left and on the right, and having a rim (1) which has respectively:
- one connecting element (6) on the left and on the right, whose end which is on the side of the temple points in the direction of the temple (2) in the folded-out state,
- wherein the temples (2) consist of a first external leaf spring (3), a central leaf spring (5) and a second external leaf spring (4) on their end on the side of the rim, each leaf spring having a leaf surface which is substantially coplanar to the connecting element (6) when the temple (2) is folded out, and
- first joint elements (9) are disposed on the connecting element (6) which cooperate with second joint elements (10) which are attached to the first and second external leaf springs (3, 4), such that a swivel joint is formed, and

each connecting element (6) is formed such that an abutment (11) for the central one (5) of the three leaf springs of the respective temple (2) is provided when the temple (2) is folded in,

5 characterized in that the second joint elements (10) at the first and second external leaf springs (3, 4) are disposed relative to the first joint elements (9) of the respective connecting element (6) such that when the respective temple (2) is folded in, the external leaf springs (3, 4) of the temple (2) are being moved over the abutment (11) of the connecting
10 element (6).

4. The glasses frame according to any one of claims 1 to 3, in which the first joint elements (9) of a connecting element (6) consists of two pivot pins.

15 5. The glasses frame according to claim 4, in which on the first and second external leaf springs (3,4) of the respective temple (2) of the connecting element (6), loops are formed which the pivot pins of the connecting element (6) engage with.

20 6. The glasses frame according to any one of claims 1 to 3, in which the first joint elements(9) of the connecting element (6) consist of two pivot pins.

25 7. The glasses frame according to claim 6, in which on the first and second external leaf springs (3,4) of the respective temple (2) of the connecting element (6), bearing shells are attached which the pivot pins of the connecting element engage with.

8. The glasses frame according to any one of claims 1 to 7, in which the connecting element (6) comprises a division into an upper bar (7) and a lower bar (8) on its entire length.
- 5
9. The glasses frame according to claim 8, in which the division of the connecting element (6) extends through the rim (1) to a cavity for receiving lenses.
- 10
10. The glasses frame according to claim 8 or 9, in which a sleeve can be pushed over the connecting element (6) before the temple (2) is connected to the connecting element (6).
- 15
11. The glasses frame according to any one of claims 1 to 10, in which all components are made of sheet metal, titanium or a mixture thereof.
12. The glasses frame according to any one of claims 1 to 11, in which the first and second external leaf springs (3,4) substantially have a resilience in the direction of a joint axis which attaches the first and second joint elements (9, 10) of the temple (2) and of the connecting element (6) in a
- 20
- pivotal connection in a captivated manner.
13. The glasses frame according to claim 12 in which the resilience consists of a spring tension applied by one of the external leaf springs (3 or 4),
- 25
- acting in direction to the other external leaf spring (4 or 3).
14. The glasses frame according to claim 12 or 13, in which a length of the first external, second external and central leaf springs (3, 4, 5) of the temple (2), and a length of the abutment (11) are such that the resilience

for achieving a connection where the first and second joint elements (9, 10) of the temple (2) and of the connecting element (6) are captivated, and resilience of the central leaf spring (5) of the temple (2) are sufficient for holding the temple (2) in its folded-out state.

5

15. The glasses frame according to claim 8, 9 or 12, in which a length of the first external, second external and central leaf springs (3, 4, 5) of the temple (2) and a length of the abutment (11) are such that resilience for holding together the upper and lower bar (7, 8) of the connecting element (6) is sufficient and furthermore, resilience of the central leaf spring (5) of the temple (2) is sufficient for holding the temple (2) in its folded-out state.

10

16. A glasses frame for receiving lenses having connecting elements (6) which are disposed on the left and on the right for attaching a temple (2) such that it is pivotable by means of joint elements (9) which are disposed on the connecting element (6), characterized in that the connecting elements (6) are designed as flat surfaces and respectively extend in direction of the temples (2), wherein the connecting elements (6) taper behind the joint elements (9) in a section, wherein the tapered section serves as an abutment (11) for the temple (2) when the temple (2) is folded in.

15

20 17. The glasses frame according to claim 14, in which the length of the first external, second external and central leaf springs (3, 4, 5) of the temple (2) and the length of the abutment (11) are such that resilience for holding together the upper and lower bar (7, 8) of the connecting element (6) is sufficient and furthermore, resilience of the central leaf spring (5) of the temple (2) is sufficient for holding the temple (2) in its folded-out state.

