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BRACELET

The invention relates to a bracelet according to the claims. It relates more particularly to a compact, flat and thin bracelet with links joined together in an articulated fashion by invisible pivot pins.

Document EP-0 236 682 describes a bracelet comprising individual links joined together by pins projecting transversely in the longitudinal direction of the bracelet. Each link comprises two pins resting in bores to enter cavities of an adjacent link. These pins are sprung with compression springs so as to connect the links with a spring force. Each link comprises a cover plate pressing against a guide surface of an adjacent link to articulate the links into all the positions of pivoting, with clearance.

Document EP-0 389 671 describes a similar bracelet, having individual links joined together removably by pivot pins arranged in the longitudinal direction of the bracelet. To connect two links, a pivot pin is provided, this pivot pin rests with clearance in two drillings in one of the links and in a bushing surrounding the pivot pin belonging to the other of the links.

The machining of such links and their assembly to obtain bracelets prove to be difficult and expensive. In particular, many walls and ramps have to be applied and many openings have to be drilled, all with great precision. During these various procedures, the individual links have to be reworked many times. What is more, these bracelets are somewhat thick and the pins connecting the individual links are partially visible from the outside, which represents a somewhat undesirable esthetic appearance.

This is why the object of the present invention is to provide a solution to these problems by creating a bracelet, for example a bracelet for a wristwatch, of



construction which is particularly compatible with known and proven manufacturing techniques. This bracelet has to be easy to manufacture and to assemble. It has to be compact, flat and thin and has to have a desirable esthetic appearance.

This object is achieved by the invention defined by the claims.

The invention will be described hereinafter with the aid of the figures, in which:

- 10 - Figures 1a to 1d show a view from above and from the side of a detail of a first preferred embodiment of a bracelet according to the invention.
- Figures 2a to 2d show a view from above and from the side of a detail of a second preferred embodiment of a bracelet according to the invention.
- Figures 3a and 3b show a view from above and from the side, partially in section, of a detail of a third preferred embodiment of a bracelet according to the invention.
- Figures 4a and 4b show a view from above and from the side, partially in section, of another detail of the third preferred embodiment of a bracelet according to Figures 3a and 3b.
- Figures 5a and 5b show a view from above and from the side, partially in section, of another detail of the third preferred embodiment of a bracelet according to Figures 3a, 3b, 4a and 4b.

The bracelet according to the invention comprises links 1,1',1" joined together in an articulated fashion via pivot pins 2,2',2". The pivot pins are invisible from the outside. As a preference, the bracelet is very flat and thin, thus representing a particularly esthetic and desirable appearance.

Three embodiments of bracelets are shown by way of example. Figures 1a to 1d show a bracelet with links joined together by chevron-shaped pivot pins. Figures 2a to 2d show a bracelet with links joined together by



elastic strips. Figures 3a to 5b show a bracelet with links joined together by cone-shaped pivot pins. The person skilled in the art, with awareness of the invention, may produce other forms of embodiment of pivot pins. As a preference, the pivot pins are truly invisible from the outside, which means, that by turning the bracelet over and observing it from the top, from the bottom and from the side, the pivot pins cannot be seen.

Highly varied materials may be used to manufacture the bracelet, such as plastics, synthetic fibers, carbon fibers and, of course, metals such as steel, for example steel of the type 316L in the form of metallic powders coated with a thermoplastic binder (MIM), etc. As a preference, the two embodiments according to Figures 1a to 2d are plastic versions and the third embodiment according to Figures 3a to 5b is a steel version.

As a preference, the links are manufactured by known molding methods applied to the most diverse materials. Such molding methods are economical and quick. Thus, the links can be manufactured integrally with the pivot pins (see the embodiment according to Figures 1a to 1d) or can be manufactured with housings 4,4',4" for the already premolded pivot pins (see the embodiments according to Figures 2a to 5b) so that all that is required later is for the pivot pins to be introduced into these housings for the links to be premanufactured for the assembly of the bracelet.

As a preference, the bracelet is assembled by joining the links together by clipping the pivot pins thus arranged on one of the links directly into corresponding openings 3,3',3" in an adjacent link. Assembly in this way is quick and easy.

The embodiment according to Figures 1a to 1d shows chevron-shaped pivot pins 2,2',2" arranged integrally with the links 1,1',1" and which can clip into corresponding openings 3,3',3" in an adjacent link. As a preference, two chevrons 2,2' are arranged



at the ends of each link. Slots 20,20' are provided near the chevrons 2,2' so that the clipping-together can be done elastically by compressing the chevrons in these slots. The ends of the chevrons allow the links to pivot with clearance in these openings. The clipping-together is done in a direction roughly transverse to the longitudinal direction of the bracelet. An upper part 10,10',10" of each link covers the chevrons and the openings so that they are invisible. This clip-together assembly is irreversible, that is to say that the bracelet cannot be taken apart.

The embodiment according to Figures 2a to 2d shows pivot pins 2,2',2" in the form of elastic strips arranged in housings 4 and which can clip into corresponding openings 3,3',3" in an adjacent link. As a preference, the two ends of an elastic strip oriented roughly transversely to the longitudinal direction of the bracelet clip into lateral openings of an adjacent link. To enter these openings, the strips can be deformed elastically. The ends of the strips can pivot with clearance in these openings. An upper part 10,10',10" of each link covers the strips and the openings so that they are invisible. This clip-together assembly is irreversible, that is to say that the bracelet cannot be taken apart.

The embodiment according to Figures 3a to 5b shows pivot pins 2,2',2",2"" in the shape of cones arranged in housings 4,4',4",4"" and which can clip into corresponding openings 3,3',3",3"" in an adjacent link. As a preference, there are four cones per link. Of these four cones, two cones are arranged roughly parallel to the longitudinal direction of the bracelet and two cones are arranged roughly transverse to the longitudinal direction of the bracelet. The cones can slide in respective housings.

The cones and their respective housings are oriented and connected together in such a way that, for each link, two parallel cones and two transverse cones can touch. The cones introduced into their housings



touch, for example, at their tips. A link with four
cones introduced into their housings may be connected
to an adjacent link by pushing the parallel cones
further into their housings, which has the reaction
5 that the transverse cones, which are in contact with
these parallel cones, are similarly pushed and come out
of their housings at least partially to enter and clip
into lateral openings of an adjacent link. To enter
these openings, the transverse cones can slide with a
10 small amount of clearance in their housings. The ends
of the transverse cones can pivot with clearance in
these openings. An upper part 10,10',10" of each link
covers the cones and the openings so that they are
invisible. The person skilled in the art, with
15 awareness of the present invention, may vary the shape
of the upper parts. Thus, he may foresee highly varied
shapes such as, for example, squares, half-moons,
double half-moons, etc. This clip-together assembly is
irreversible, that is to say that the bracelet cannot
20 be taken apart.





CLAIMS

1. Bracelet comprising links (1,1',1") joined together in an articulated fashion, characterized in that it comprises pivot pins (2,2',2",2'') which are invisible from the outside.
2. Bracelet according to claim 1, characterized in that the pivot pins have the shape of chevrons arranged integrally with the links.
3. Bracelet according to claim 1, characterized in that the pivot pins have the shape of elastic strips arranged in housings (4).
4. Bracelet according to claim 1, characterized in that the pivot pins have the shape of cones arranged in housings (4,4',4",4'').
5. Bracelet according to claim 4, characterized in that there are four cones per link, in that of these four cones, two cones are arranged roughly parallel to the longitudinal direction of the bracelet and two cones are arranged roughly transverse to the longitudinal direction of the bracelet, in that the cones can slide in respective housings allowing a link to be connected, with four cones introduced into their respective housings, to an adjacent link by pushing the parallel cones further into their housings so that the transverse cones, being in contact with these parallel cones, are pushed and come out of their housings at least partially to enter and clip into lateral openings of an adjacent link.
6. Bracelet according to one of claims 1 to 5, characterized in that the pivot pins (2,2',2",2'') arranged on one of the links rest with clearance in corresponding openings (3,3',3",3'') of an adjacent link.
7. Bracelet according to claim 6, characterized in that the ends of the pivot pins allow the links to pivot with clearance in the openings.
8. Bracelet according to claim 6 or 7, characterized in that the pivot pins (2,2',2",2'') and



the corresponding openings (3,3',3'',3''') of one are covered by upper parts (10,10',10''). [sic]

9. Bracelet according to one of claims 1 to 8, characterized in that it is used for flat thin
5 wristwatches.

10. Method for manufacturing and assembling a bracelet according to one of claims 1 to 9, characterized in that the links (1,1',1'') are manufactured by molding and in that the bracelet is
10 assembled by joining the links together by clipping pivot pins (2,2',2'',2''') arranged on one of the links directly into corresponding openings (3,3',3'',3''') of an adjacent link.

