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(54) Bracelet de construction métallique et montre munie d'un tel bracelet.

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Description

La présente invention découle de la constatation d'un problème qui n'avait pas été perçu jusqu'à maintenant, et qui est relatif aux montres de type indémontable. On sait que, depuis quelques années, des montres de type indémontable ont rencontré un succès grandissant. Les plus connues de ces montres comportent un corps de boîte en matière plastique qui forme le pourtour et le fond de la boîte et dont la surface intérieure est conformée de manière à supporter tous les éléments fonctionnels de la montre. Ce corps de boîte est recouvert par un cadran que traversent les canons des rouages indicateurs et par un verre qui est soudé définitivement au corps de boîte et tient le cadran en place.

Jusqu'à maintenant le bracelet de ces montres était en matière plastique souple et la liaison entre le corps de boîte et les deux brins du bracelet était réalisée de préférence par une charnière comportant une tige et deux charnons munis chacun d'au moins trois oeillets. Dans cette construction la tige traverse les oeillets des deux charnons et est chassée dans ceux du charnon du bracelet. Le document CH 647917 décrit ce mode de liaison. Dans un exemple, le corps de boîte est en matériau ABS tandis que le bracelet est en un élastomère ou en PVC. Pour le corps de boîte les matériaux connus sous les dénominations ASA ou SAN peuvent aussi être utilisés. Ces choix répondent parfaitement aux critères consistant à rechercher simultanément la fiabilité et le faible coût de production, critères qui, comme on le sait, conditionnent la construction des montres de type indémontable.

Cependant on a constaté que les bracelets réalisés selon ces critères ont une durée de vie beaucoup plus courte que celle des modules de montres, et la présente invention vise à proposer une solution à ce qui apparaît dès lors comme un problème, en préservant les avantages de la montre de type indémontable.

La recherche de cette solution pouvait impliquer le recours à des bracelets métalliques de type connu, mais ceux-ci nécessitent l'emploi de barrettes à ressort dont les pivots sont normalement accrochés aux cornes du corps de boîte. Or les corps de boîtes pourvus de cornes sont difficilement compatibles avec des réalisations en matière plastique. Par ailleurs, ces bracelets métalliques pourraient, en frottant sur les cornes, très rapidement les user, ce qui irait à l'encontre du but recherché, qui consiste à augmenter la durée normale d'utilisation d'une montre en matière plastique.

L'invention a pour premier objet un bracelet de construction métallique comportant au moins une extrémité destinée à être reliée de manière articulée à une boîte de montre, caractérisé en ce que ladite extrémité comporte un charnon en matière plastique présentant au moins un oeillet destiné à recevoir une tige d'articulation, ledit charnon étant emprisonné dans un maillon métallique creux.

Un second objet de l'invention est une montre comportant un corps de boîte en matière plastique et un tel bracelet comportant deux brins, et dont chaque brin du bracelet est relié au corps de boîte par une charnière, caractérisé en ce que la charnière comporte un premier charnon qui est d'une pièce avec le corps de boîte et du même matériau que lui, et un second charnon, en matière plastique, et en ce que le bracelet est en métal, le second charnon de la charnière étant fixé rigidement à une partie métallique extrême du bracelet, ledit second charnon étant emprisonné dans un maillon métallique creux.

On va décrire ci-après, à titre d'exemple une forme d'exécution de l'objet de l'invention en se référant au dessin annexé, dont,

- la figure 1 est une vue partielle en plan de dessous d'une montre et d'une extrémité de son bracelet ;
- la figure 2 est une coupe schématique selon la ligne II-II de la figure 1 ;
- la figure 3 est une coupe schématique selon la ligne III-III de la figure 1 ; et
- la figure 4 est une vue en perspective éclatée montrant l'extrémité du bracelet visible à la figure 1.

La montre représentée au dessin comporte un corps de boîte 1 en une pièce de matière plastique telle que l'un des matériaux désignés par ABS, ASA, ou SAN par exemple. Elle comporte en outre un bracelet 2 dont un brin est visible au dessin. Le corps de boîte 1 forme en une pièce le fond et la carrure de la boîte et sa surface intérieure est conformée de manière à constituer la cage de la montre, c'est-à-dire à supporter directement tous les composants fonctionnels : oscillateur, moteur, rouage, circuit intégré, etc. Un cadran 3 recouvre les composants. Il est tenu en place par un verre 4 en matière plastique par exemple du Plexiglas (marque déposée) qui est fixé définitivement et de manière étanche, par exemple par soudage, dans une creusure annulaire 5. La surface supérieure du corps de boîte est recouverte d'une coiffe en métal 6. Cette coiffe est tenue rigidement en place par la glace 4, grâce à un talon 4' s'étendant radialement vers la périphérie.

Sur 12 heures et 6 heures, le corps de boîte 1 présente une conformation en charnon, c'est-à-dire qu'il est pourvu de quatre nervures 7 saillantes sur son côté inférieur, recouvertes par un voile 8 de liaison. Les nervures 7 forment des oeillets. Elles sont percées de trous 9 coaxiaux et circulaires, destinés à recevoir une tige d'articulation 10.

Telle que décrite ci-dessus, une montre de ce type peut avoir une durée d'utilisation de plusieurs années, par exemple 5 ans ou même plus. Le fond du boîtier est en général muni d'une ouverture pourvue

d'une trappe amovible, ce qui permet l'échange périodique de la pile.

Le bracelet 2 relié à la montre décrite est un bracelet de type métallique. On sait qu'il existe des bracelets métalliques à maillons articulés, des bracelets extensibles formés d'éléments rigides reliés par des ressorts, des bracelets en tissus métalliques, etc. En principe le bracelet de la montre décrite peut être de n'importe quel type, celui qui est représenté au dessin étant de préférence un bracelet à maillons rigides reliés par des éléments élastiques. Ces maillons sont formés eux-mêmes de deux segments de tôle mince découpés et pliés ou emboutis de manière à former des cages dans lesquelles des lames élastiques qui relient les maillons les uns aux autres sont engagées. Ainsi aux figures 2 et 3 les maillons 11 et 12 du bracelet 2 sont des éléments rigides et reliés de manière extensible sans qu'il soit nécessaire de les décrire plus en détail. Il faut toutefois relever que le maillon 12 comporte une anse 12a de son côté adjacent au maillon 14. La fonction de cette anse sera précisée ci-après.

Il reste donc à décrire le dernier maillon 14 de chacun des brins du bracelet 2. Le maillon comporte deux éléments de tôle 15 et 16 et un charnon 17. Ces éléments 15 et 16 et le charnon 17 sont présentés à la figure 4 dans leur état avant assemblage. Les deux éléments 15 et 16 sont préalablement découpés et partiellement pliés et emboutis de manière à pouvoir être assemblés l'un à l'autre par une opération de pliage.

Plus précisément, l'élément supérieur 15 présente trois bossages 15a, 15b et 15c sur sa face supérieure, un rabat 15d sur la tranche destinée à être adjacente au maillon 12, deux languettes latérales 15e, l'une seulement étant visible au dessin et trois pattes de charnon 15f.

Les deux bords latéraux comportent chacun un décrochement 16c dans lesquelles les languettes 15e sont engagées.

L'élément inférieur 16 présente une surface plane de forme générale rectangulaire. Les côtés longitudinaux comportent une languette 16a, l'autre un rebord plié 16b, s'étendant tous deux perpendiculairement à la surface plane. La languette 16a est destinée à être adjacente au maillon 12.

Le charnon 17 est en matière plastique, avantageusement en un matériau élastique choisi parmi ceux généralement utilisé pour la fabrication de bracelets plastiques. Il comporte trois oeillets coaxiaux 17a de largeur supérieure à celle des pattes 15f. Ces oeillets sont chacun percé d'un trou 17b, les trous 17b étant coaxiaux et de diamètre légèrement inférieur à celui de la tige 10. La face inférieure du charnon 17 est munie d'une gorge rectiligne 17e, perpendiculaire aux bords latéraux du bracelet. Enfin, la face supérieure du charnon comporte deux bossages 17c et 17d, sensiblement de même forme que les bossages 15b et 15c de l'élément 15.

L'assemblage du maillon 14 et sa fixation au reste du bracelet se fait au moyen d'un posage non représenté au dessin. L'élément 16 est tout d'abord posé à plat, de manière que la languette 16a et le rebord 16b soient tournés vers le haut. Le bracelet est ensuite mis en place, l'anse 12a s'accrochant dans la languette 16a. Le charnon 17 est posé sur l'élément 16, à cheval sur le rebord 16b, ce dernier étant engagé dans la gorge 17e. Enfin, l'élément 15 recouvre le charnon 17 et l'élément 16, de manière que que le rabat 15d soit aligné avec la languette 16a, que les deux languettes 15e soient engagées dans les décrochements 16c et que les bossages 15c et 15b soient respectivement alignés sur les bossages 17c et 17d du charnon 17. Le posage est alors actionné pour plier les deux languettes 15e et les trois pattes 15f. Plus précisément les languettes 15e sont repliées sous la face inférieure de l'élément 16 alors que les pattes 15f épousent la forme des oeillets 17a.

Le montage du bracelet ainsi réalisé sur la boîte se fait par emboîtement des oeillets 17a dans les espaces compris entre les oeillets 7 de la boîte, de manière que les trous 9 soient coaxiaux aux trous 17b, et engagement de la tige 10 dans les trous 9 et 17b. Cette tige 10 est fixée par serrage élastique de la matière du charnon 17.

Dans le cas où la boîte 1 est munie d'une coiffe 6, on constate que la montre est largement protégée par des pièces en métal, ce qui améliore l'esthétique à long terme. Par ailleurs, la liaison du bracelet métallique et de la boîte reste simple, économique et sans risque de voir le bracelet métallique user prématurément les cornes ou les oeillets de la boîte en plastique. En outre, grâce aux pattes 15f, la partie du bracelet en matière plastique qui est mécaniquement la plus faible est sensiblement renforcée.

Dans la montre décrite, la charnière comporte plusieurs oeillets tant au bracelet qu'à la boîte. Dans le cas où le matériau de la boîte est suffisamment rigide, il est également envisageable d'utiliser une structure classique avec cornes et barrettes. Même dans ce cas, il est possible d'utiliser un bracelet selon l'invention. De la sorte, la fonction essentielle du charnon est d'éviter que le bracelet n'use les cornes de la boîte lorsque la matière de celle-ci est plus tendre que celle du métal du bracelet.

Pour réaliser les extrémités du bracelet, il pourrait également être possible de fabriquer les charnons par moulage sur le bracelet assemblé, ce dernier étant alors introduit dans le moule avant que la matière plastique ne soit injectée.

Dans une solution simplifiée, il serait également possible de supprimer l'élément 16 et d'assurer la fixation de l'élément 15 en rabattant les languettes et les pattes directement sur le charnon 17. Dans ce cas, la fonction de la languette 16a devrait être remplie par une autre languette solidaire de l'élément 15. De plus,

le chamon 17 pourrait se prolonger jusqu'au voisinage de cette languette pour assurer le blocage de l'anse 12a.

Revendications

1. Bracelet de construction métallique (2) comportant une extrémité (14) destinée à être reliée de manière articulée à une boîte de montre (1), caractérisé en ce que ladite extrémité comporte un charnon en matière plastique (17), présentant au moins un oeillet (17a) destiné à recevoir une tige d'articulation (10), ledit charnon étant emprisonné dans un maillon métallique creux.

2. Bracelet selon la revendication 1 caractérisé en ce que le maillon métallique creux est constitué de deux segments (15, 16) de plaques métalliques pliées ou embouties l'une sur l'autre, ce maillon étant articulé et/ou relié de manière extensible au reste du bracelet.

3. Bracelet selon la revendication 2, caractérisé en ce que le charnon du bracelet présente une gorge transversale (17e) dans laquelle est engagée un rebord plié (16b) de l'un desdits segments de plaques (16).

4. Bracelet selon la revendication 2, caractérisé en ce qu'il est formé d'un ensemble de maillons d'apparence semblable articulés ou reliés de manière extensible les uns aux autres et en ce que ledit maillon métallique creux présente également la même apparence que les autres maillons.

5. Bracelet selon l'une quelconque des revendications 2 à 4, caractérisé en ce que que l'un des segments (15) qui constituent le maillon métallique creux comporte au moins une patte (15f) et en ce que chaque oeillet est au moins partiellement recouvert par l'une desdites pattes.

6. Bracelet selon l'une des revendications 1 à 5, caractérisé en ce que le charnon présente au moins deux oeillets coaxiaux.

7. Montre comportant un corps de boîte en matière plastique et un bracelet selon la revendication 1 qui comporte deux brins, et dont chaque brin (2) est relié au corps de boîte par une charnière, caractérisée en ce que la charnière comporte un premier charnon qui est d'une pièce avec le corps de boîte et du même matériau que lui, et un second charnon (17), en matière plastique, et en ce que le bracelet est en métal, le second charnon de la charnière étant fixé rigidement à une partie métallique extrême (12) du bracelet, ledit second charnon étant emprisonné dans un maillon métallique creux.

8. Montre selon la revendication 7, caractérisée en ce que le second charnon (17) de la charnière est en matière plastique élastique et en ce qu'une tige de charnière (10) est fixée rigidement par serrage à ce second charnon.

9. Montre selon la revendication 7, caractérisée en ce que le corps de boîte est revêtu d'une coiffe métallique.

Patentansprüche

1. Armband (2) mit metallischem Aufbau mit einem Ende (14), das auf gelenkige Weise mit einem Uhrengehäuse (1) zu verbinden ist, dadurch gekennzeichnet, daß das Ende einen Scharnierteil (17) aus Kunststoff enthält, der wenigstens eine Öse (17a) zur Aufnahme eines Gelenkstiftes (10) aufweist, wobei dieser Scharnierteil in einem hohlen, metallischen Kettenglied eingeschlossen ist.

2. Armband nach Anspruch 1, dadurch gekennzeichnet, daß das hohle, metallische Kettenglied aus zwei metallischen Plattensegmenten (15, 16) gebildet wird, von denen das eine über das andere gebogen oder gebördelt ist, wobei das Kettenglied verlängerbar am Rest des Armbandes angelenkt und/oder mit diesem verbunden ist.

3. Armband nach Anspruch 2, dadurch gekennzeichnet, daß der Scharnierteil des Armbandes eine querlaufende Rille (17e) aufweist, in welche eine umgebogene Randleiste (16b) eines der genannten Plattensegmente (16) eingreift.

4. Armband nach Anspruch 2, dadurch gekennzeichnet, daß es aus einem Satz von Kettengliedern mit ähnlichem Aussehen gebildet ist, die verlängerbar aneinander angelenkt oder miteinander verbunden sind und daß das hohle, metallische Kettenglied ebenfalls das gleiche Aussehen wie die anderen Kettenglieder aufweist.

5. Armband nach einem der Ansprüche 2 bis 4, dadurch gekennzeichnet, daß eines der Segmente (15), die das hohle, metallische Kettenglied bilden, wenigstens einen Lappen (15f) aufweist und daß jede Öse wenigstens teilweise durch einen der Lappen überdeckt ist.

6. Armband nach einem der Ansprüche 1 bis 5, dadurch gekennzeichnet, daß der Scharnierteil wenigstens zwei koaxiale Ösen aufweist.

7. Uhr mit einem Gehäusekörper aus Kunststoff und einem Armband nach Anspruch 1, das zwei Stücke enthält und wovon jedes Stück (2) durch ein Scharnier mit dem Gehäusekörper verbunden ist, dadurch gekennzeichnet, daß das Scharnier einen ersten Scharnierteil, der einstückig mit dem Gehäusekörper und aus dem gleichen Werkstoff wie dieser ist, und einen zweiten Scharnierteil (17) aus Kunststoff enthält, und daß das Band aus Metall ist, wobei der zweite Scharnierteil des Scharniers starr an einem metallischen Endteil (12) des Armbandes befestigt ist und wobei der zweite Scharnierteil in einem hohlen, metallischen Kettenglied eingeschlossen ist.

8. Uhr nach Anspruch 7, dadurch gekennzeichnet, daß der zweite Scharnierteil (17) des Scharniers

aus elastischem Kunststoff besteht und daß ein Schamierstift (10) durch Pressung starr mit dem zweiten Schamierteil verbunden ist.

9. Uhr nach Anspruch 7, dadurch gekennzeichnet, daß der Gehäusekörper mit einer metallischen Abdeckung überzogen ist.

Claims

1. Bracelet of metallic construction (2) including an end (14) intended to be hingedly coupled to a watch case (1), characterized in that said end includes a hinge knuckle of plastic material (17) presenting at least one eyelet (17a) adapted to accomodate a hinge pin (10), said hinge knuckle being confined within a hollow metallic link.

2. Bracelet according to claim 1, characterized in that the hollow metallic link is made up of two metallic plate segments (15, 16) bent or swaged onto one another, such link being hinged and/or coupled in an extensible manner to the rest of the bracelet.

3. Bracelet according to claim 2, characterized in that the hinge knuckle of the bracelet exhibits a transversal groove (17e) in which is retained a folded flange (16b) of one of said plate segments (16).

4. Bracelet according to claim 2, characterized in that it is formed of a set of links of similar appearance to one another, hinged to one another or coupled in an extensible manner to one another and in that said hollow metallic link is of appearance similar to the other links.

5. Bracelet according to any one of claims 2 to 4, characterized in that one of the segments (15) making up the hollow metallic link includes at least one tab (15f) and in that each eyelet is at least partially covered by a tab.

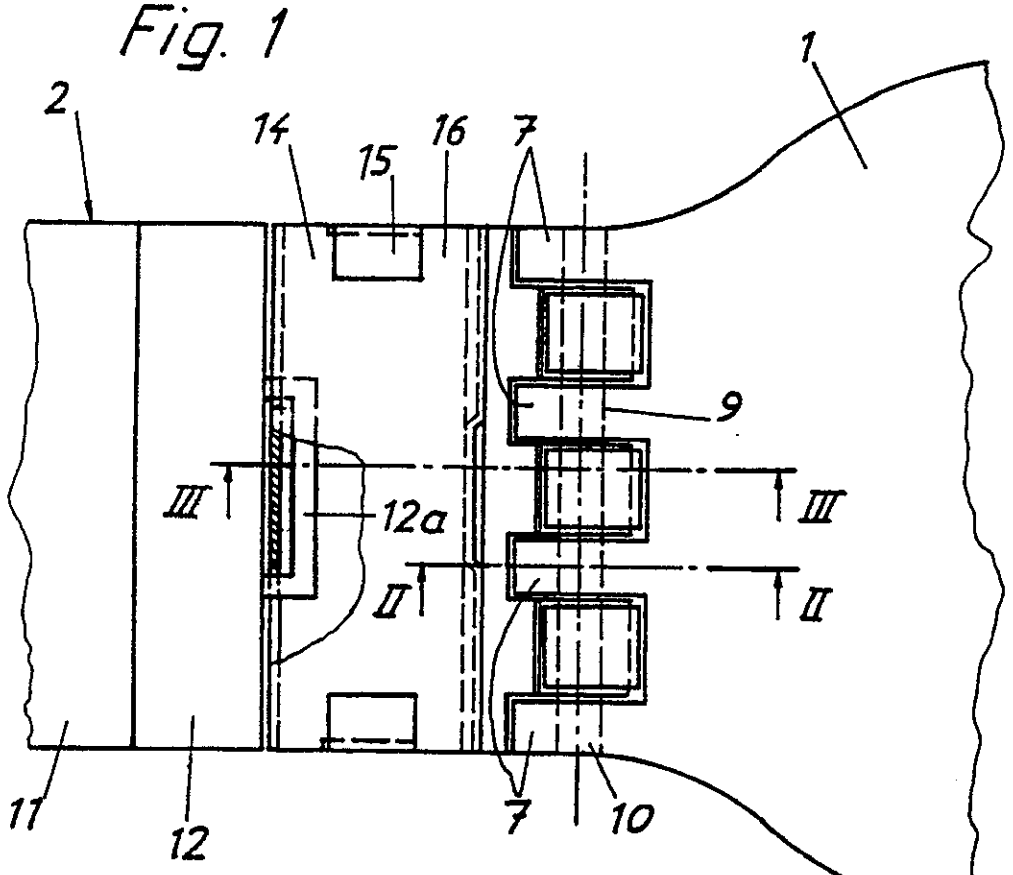
6. Bracelet according to any one of claims 1 to 5, characterized in that the hinge knuckle is provided with at least two coaxial eyelets.

7. Watch including a case body of plastic material and a bracelet according to claim 1, which includes two strands, and each of which (2) is coupled to the case body by a hinge, characterized in that the hinge includes a first hinge knuckle integral with the case body and formed of the same material and a second hinge knuckle (17), of plastic material, and in that the bracelet is of metal, the second hinge knuckle being rigidly fixed to a metallic end part (12) of the bracelet, said second hinge being confined within a hollow metallic link.

8. Watch according to claim 7, characterized in that the second hinge knuckle (17) is of elastic plastic material and in that a hinge pin (10) is rigidly fixed by clamping to said second hinge knuckle.

9. Watch according to claim 7, characterized in that the case body is overlaid with a metallic cap.

Fig. 1



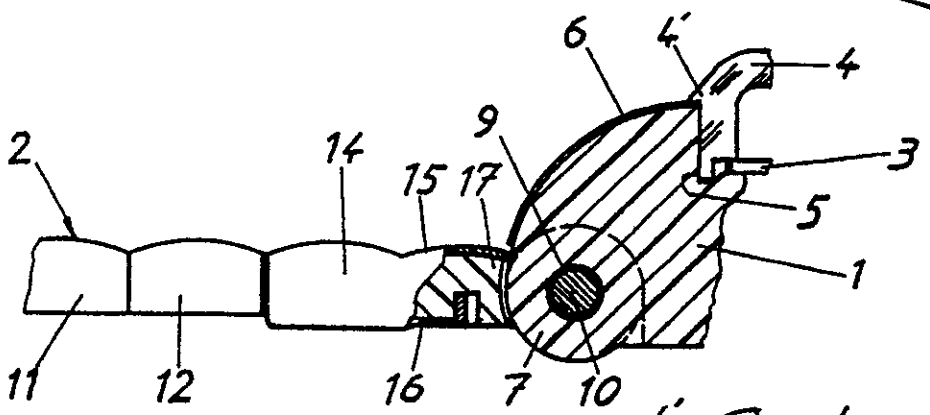


Fig. 2

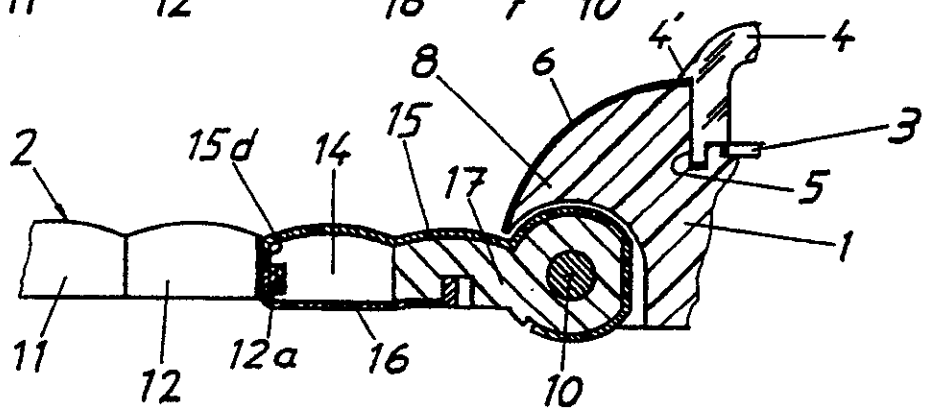
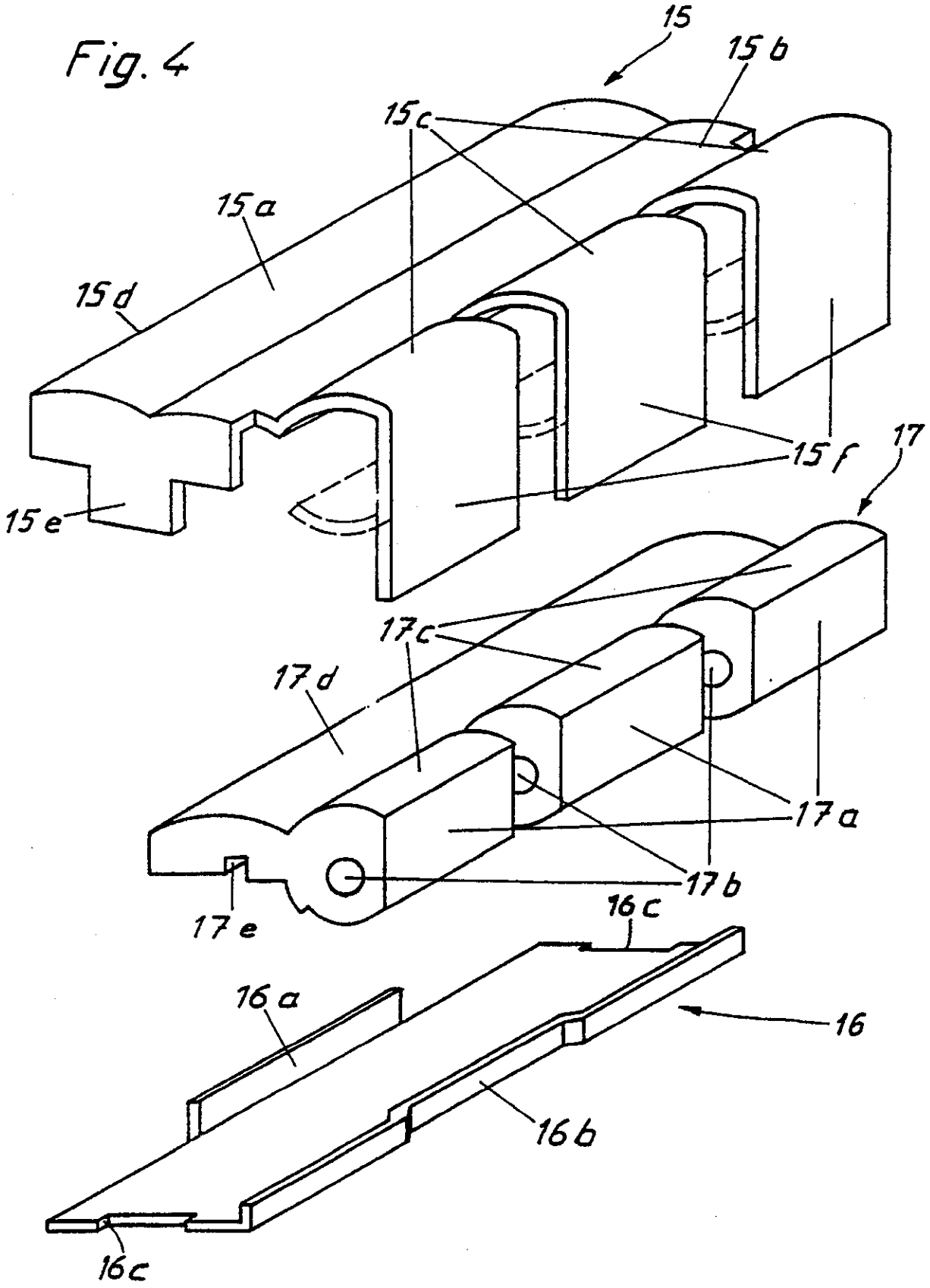


Fig. 3

Fig. 4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CERTIFICATE

I, Jacques de Raemy , of Rue de l'Orient 15 , 1400 Yverdon-Les-Bains , Switzerland , do hereby certify that I am conversant with the English and French languages and am a competent translator thereof, and I further certify that to the best of my knowledge and belief the following translation is a true and correct translation made by me of a specification of European Patent No. 0 355 677 (Application No. 89 115 064.1) in the French language prepared in pursuance of The Patent (Amendment) Rules 1987.

Signed this 17th day of January 1992

J. de Raemy

Jacques de Raemy

This invention originates in the discovery of a problem which had not been noted up until the present and which relates to watches of the type which cannot be disassembled. It is known that for several years now watches of this type have met with growing success. The best known of such watches include a case body of plastic material which forms the periphery and bottom of the case and the inner surface of which is formed in a manner to support all the functional elements of the watch. This case body is capped by a dial through which pass the pipes of the indicator wheels and by a crystal which is permanently welded to the case body and retains the dial in place.

Up till the present time the bracelet of such watches was of flexible plastic material and the connection between the case body and the two strands of the bracelet was brought about by a hinge including a pin and two knuckles, each provided with at least three eyelets. In this arrangement the pin goes through the eyelets of the two knuckles and is force fitted into those of the knuckle attached to the bracelet. Patent document CH 647 917 describes this type of connection. In one example the case body is of the material known as ABS, while the bracelet is an elastomeric material or of PVC. For the case body materials known under the designations ASA or SAN may also be employed. These choices respond perfectly to the criteria which seek at the same time reliability and low production cost, such criteria being, as is well known, determinative in the construction of watches of the type not subject to being disassembled.

However, it has been noted that bracelets provided in accordance with these criteria have a life duration much shorter than that of the watch modules and the present

invention aims to provide a solution to what appears at this point as a problem in conserving the advantages of watches of the type not subject to disassembly.

The research leading to this solution might suggest resort to metallic bracelets of a known type, but the latter necessitate the use of spring bars, the pivots of which are normally attached to lugs on the case body. However, case bodies provided with lugs are difficult to reconcile with manufacture in plastic material. Furthermore, such metallic bracelets may in rubbing against the lugs, wear them out rapidly, this going against the purpose which is here sought, which consists in increasing the normal duration of utilization of a watch made of plastic material.

The first objective of the invention is a bracelet of metallic construction including at least one end intended to be coupled in an articulated manner to a watch case, characterized in that said end includes a knuckle of plastic material exhibiting at least one eyelet intended to receive an articulation pin, said knuckle being confined in a hollow metallic link.

The second object of the invention is a watch including a case body of plastic material and a bracelet including two strands, each bracelet strand being coupled to the case body by a hinge characterized in that the hinge includes a first knuckle which is integral with the case body and of the same material and a second knuckle of plastic material, and in that the bracelet is formed of metal, the second knuckle of the hinge being rigidly fastened to a metallic end piece of the bracelet, said second knuckle being confined in a hollow metallic link.

Hereinafter there will be described by way of example an embodiment of the object of the invention which is illustrated by means of the attached drawings.

- Figure 1 is a partial plan view from below of a watch and of one end of its bracelet;
- figure 2 is a schematic cross-section along line II-II of figure 1;
- figure 3 is schematic cross-section along line III-III of figure 1;
- figure 4 is an exploded perspective view showing the end of the bracelet visible on figure 1.

The watch shown on the drawings includes a case body 1 in one piece formed from plastic material such as one of the materials designated as ABS, ASA or SAN for instance. It includes furthermore a bracelet 2 of which one strand is visible on the drawings. The case body 1 provides the back cover and the caseband in one piece and its inner surface is formed in a manner such as to constitute the cage of the watch, i.e. to support directly all the functional components: oscillator, motor, wheel works, integrated circuit, etc. A dial 3 covers the components. It is held in place by a crystal 4 of plastic material, for instance Plexiglass (registered trademark), which is permanently fastened in a watertight manner, for instance by welding, in an annular hollow 5. The upper surface of the case body is covered by metal cap 6. Such cap is rigidly held in place by crystal 4 by means of a heel 4' extending radially towards the periphery.

At 12 o'clock and at 6 o'clock, the case body 1 exhibits a knuckle formation, i.e. it is provided with

four ribs 7 projecting from its lower side and having a connecting cover 8. The ribs 7 form the eyelets. They are pierced with coaxial circular holes 9 intended to accommodate a hinge pin 10.

As described hereinabove, a watch of this type may have a life duration of several years, for instance five years or even more. The back of the case is generally provided with an opening with a removable cover thus permitting periodic battery changes.

The bracelet 2 coupled to the watch as described is of the metallic type. Included among known metallic bracelets are those having articulated links, extensible bracelets formed of rigid elements coupled by springs, bracelets of metallic tissues, etc. In principle the bracelet for the watch as described may be of any of the known types, that which is shown on the drawing being preferably a bracelet of rigid links coupled by elastic elements. Such links are themselves formed from two segments of thin sheet metal blanked and formed or drawn in a manner to provide cages in which the elastic blades which couple the links to one another are engaged. Thus, on figure 2 and 3, links 11 and 12 of bracelet 2 comprise rigid elements coupled in an extensible manner, but it seems unnecessary to provide here further details thereof. It is necessary nevertheless to mention that link 12 includes a lug 12a on its side adjacent link 14. The function of such lug will be set out in detail hereinafter.

There remains to be described the last link 14 of each of the strands of bracelet 2. This link includes two sheet metal elements 15 and 16 and a knuckle 17. These

elements 15 and 16 and knuckle 17 are shown on figure 4 before they have been assembled. The two elements 15 and 16 are initially blanked and partially formed and drawn in a manner to be adapted for assembly to one another by a bending operation.

More precisely, the upper element 15 exhibits three humped portions 15a, 15b and 15c on its upper face, a flap 15d on the edge intended to be adjacent link 12, two lateral tongues 15e, one only of which is visible on the drawing and three knuckle tabs 15f.

The two lateral edges of element 16 each comprise a cut out 16c into which tongues 15e are engaged.

The lower element 16 exhibits a plane surface of generally rectangular form. The longitudinal sides include on the one hand a tongue 16a, on the other a struck up flange 16b, both of which extend perpendicular to the planar surface. Tongue 16a is intended to be adjacent a link 12.

Knuckle 17 is of plastic material, advantageously of an elastic material chosen from among those generally employed for the manufacture of plastic bracelets. It includes three coaxial eyelets 17a of width greater than that of the tabs 15f. Each of these eyelets is pierced with a hole 17b, holes 17b being coaxial and of a diameter slightly less than that of the pin 10. The lower face of the knuckle 17 is provided with a rectilinear groove 17e perpendicular to the lateral edges of the bracelet. Finally, the upper face of the knuckle includes two humped portions 17c and 17d having substantially the same form as the humped portions 15b and 15c of element 15.

The assembly of link 14 and its attachment to the remainder of the bracelet is accomplished by means of a jig not shown on the drawing. Element 16 is initially set out flat in a manner such that tongue 16a and flange 16b are turned upwardly. The bracelet is next put into place with lug 12a hooking into tongue 16a. The knuckle 17 is placed over element 16 straddling flange 16b, this latter being engaged in groove 17e. Finally, element 15 covers the knuckle 17 and the element 16 in a manner such that the flap 15d is aligned with tongue 16a such that the two tongues 15e are engaged in the cut outs 16c and that the humped portions 15c and 15b are respectively aligned over the humped portions 17c and 17d of knuckle 17. The jig is then operated in order to fold the two tongues 15e and the three tabs 15f. More precisely, tongues 15e are folded under the lower face of element 16 while the tabs 15f are brought to match the form of eyelets 17a.

The assembly of the bracelet as thus realized with the case is brought about by meshing of eyelets 17a within the spaces comprised between the eyelets 7 of the case in a manner such that the holes 9 are coaxial with holes 17b and thereupon engaging pin 10 in holes 9 and 17b. Such pin 10 is retained by elastic clamping of the material of knuckle 17.

Should case 1 be provided with a cap 6, it will be noted that the watch is protected to a great extent by the metallic parts which improve the appearance on a long term basis. Furthermore, the connection of the metallic bracelet and the case remains simple, economic and without risking premature wear by the metallic bracelet

of the lugs or the eyelets of the plastic case. Furthermore, in view of the tabs 15f, the portion of the bracelet of plastic material which is mechanically the weakest, is substantially reinforced.

In the watch as described, the hinge includes several eyelets, both on the bracelet and the case. Should the material of the case be sufficiently rigid, it is likewise possible to envisage the employment of a standard known structure with lugs and spring bars. Even here it is possible to employ a bracelet according to the invention. In such instance the essential function of the knuckle is that of avoiding wear of the case lugs by the bracelet when the material of such lugs is softer than that of the bracelet metal.

To obtain the ends of the bracelet, it would likewise be possible to manufacture the knuckles by direct moulding onto an assembled bracelet, the latter being introduced into a mould before the plastic material was injected therein.

In a simplified solution, it would likewise be possible to eliminate element 16 and to assure the fastening of element 15 by folding back the tongues and the tabs directly onto the knuckle 17. In this case the function of tongue 16a would be fulfilled by another tongue integral with element 15. Furthermore, the knuckle 17 could be elongated to the proximity of such tongue in order to assure blocking of lug 12a.

CLAIMS

1. Bracelet of metallic construction (2) including an end (14) intended to be hingedly coupled to a watch case (1), characterized in that said end includes a hinge knuckle of plastic material (17) presenting at least one eyelet (17a) adapted to accomodate a hinge pin (10), said hinge knuckle being confined within a hollow metallic link.

2. Bracelet according to claim 1, characterized in that the hollow metallic link is made up of two metallic plate segments (15, 16) bent or swaged onto one another, such link being hinged and/or coupled in an extensible manner to the rest of the bracelet.

3. Bracelet according to claim 2, characterized in that the hinge knuckle of the bracelet exhibits a transversal groove (17e) in which is retained a folded flange (16b) of one of said plate segments (16).

4. Bracelet according to claim 2, characterized in that it is formed of a set of links of similar appearance to one another, hinged to one another or coupled in an extensible manner to one another and in that said hollow metallic link is of appearance similar to the other links.

5. Bracelet according to any one of claims 2 to 4, characterized in that one of the segments (15) making up the hollow metallic link includes at least one tab (15f) and in that each eyelet is at least partially covered by a tab.

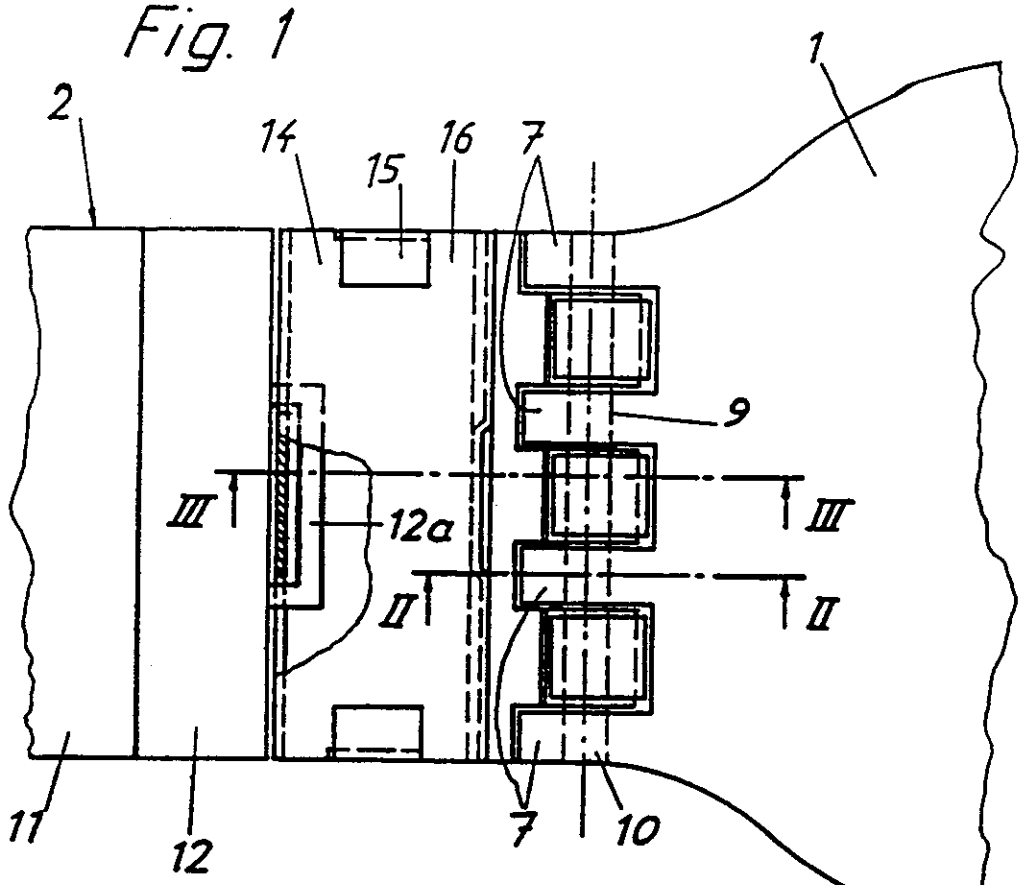
6. Bracelet according to any one of claims 1 to 5, characterized in that the hinge knuckle is provided with at least two coaxial eyelets.

7. Watch including a case body of plastic material and a bracelet according to claim 1, which includes two strands, and each of which (2) is coupled to the case body by a hinge, characterized in that the hinge includes a first hinge knuckle integral with the case body and formed of the same material and a second hinge knuckle (17), of plastic material, and in that the bracelet is of metal, the second hinge knuckle being rigidly fixed to a metallic end part (12) of the bracelet, said second hinge being confined within a hollow metallic link.

8. Watch according to claim 7, characterized in that the second hinge knuckle (17) is of elastic plastic material and in that a hinge pin (10) is rigidly fixed by clamping to said second hinge knuckle.

9. Watch according to claim 7, characterized in that the case body is overlaid with a metallic cap.

Fig. 1



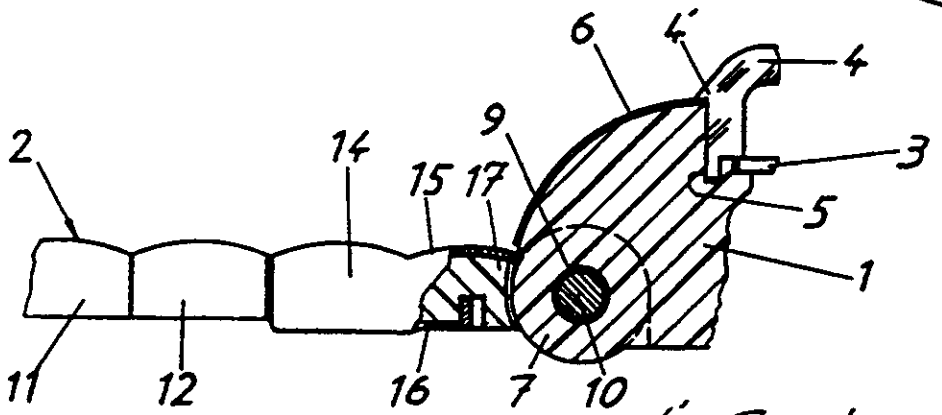


Fig. 2

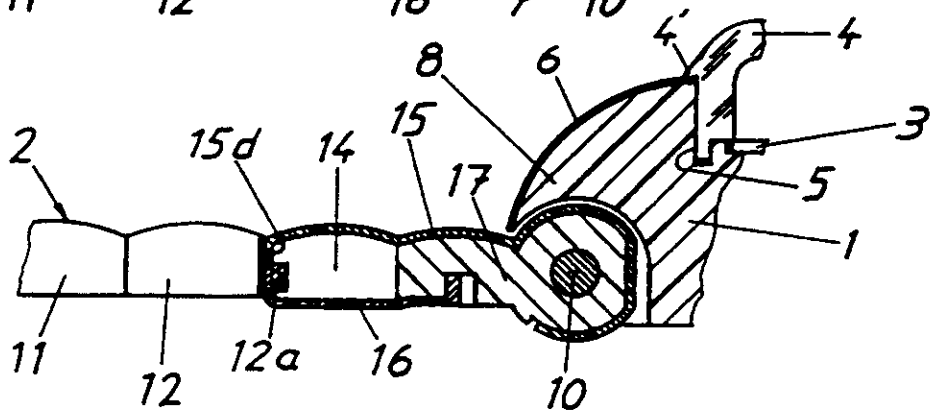
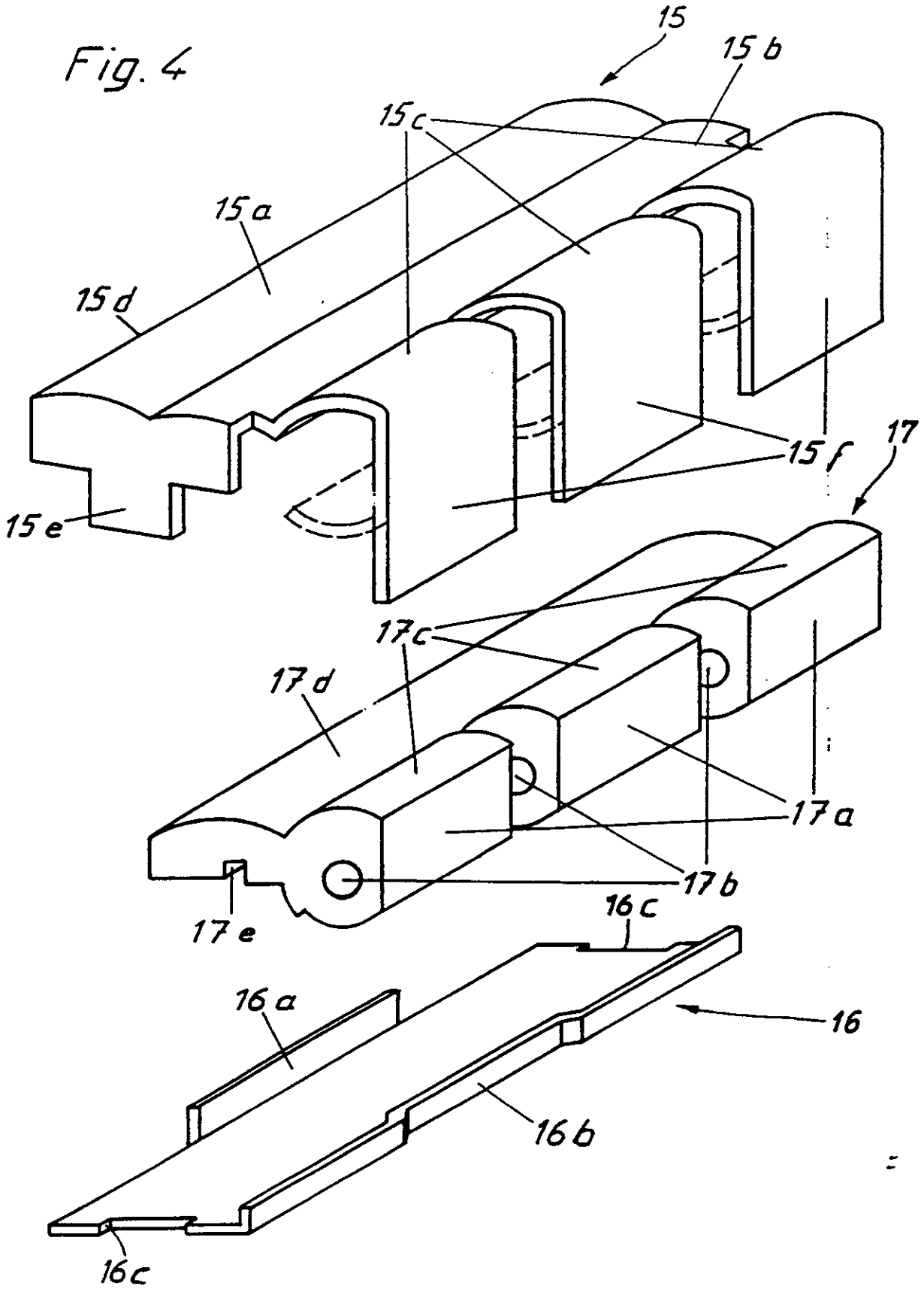


Fig. 3

Fig. 4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Case 645

STATUTORY DECLARATION

I, Gerard Caron, of Rue des Vignolants 33, 2000 Neuchâtel, Switzerland, do hereby solemnly and sincerely declare that I am well acquainted with the French and English languages and that the following translation is a true translation into the English language of an official copy of the European Patent Specification No 0 355 677 filed in Munich on the 16th August 1989 and of the official certificate attached thereto.

AND I MAKE THIS SOLEMN DECLARATION, conscientiously believing the same to be true and by virtue of the provisions of the Statutory Declarations Act, 1835.

DECLARED AT Biel-Bienne
Switzerland

this 10th day of October, 1994

Before me,

Notary Public

L E G A L I Z A T I O N

I, the undersigned Marc F. Suter, notary public of the canton of Berne (Switzerland), with residence at Bienne, certify by the present act that the foregoing signature has been written sig. "Caron" by Mr. Gerard CARON, born 1940, a Dutch citizen, engineer, at 2000 Neuchâtel, rue des Vignolants 33. Mr. Gerard Caron is competent to act and known to the notary personally.

Certified at the office of the undersigned notary public at Bienne, this tenth day of October nineteen hundered and ninety-four.

D.d. October 10, 1994

Reg. B no 6952

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This invention originates in the discovery of a problem which had not been noted up until the present and which relates to watches of the type which cannot be disassembled. It is known that for several years now watches of this type have met with growing success. The best known of such watches include a case body of plastic material which forms the periphery and bottom of the case and the inner surface of which is formed in a manner to support all the functional elements of the watch. This case body is capped by a dial through which pass the pipes of the indicator wheels and by a crystal which is permanently welded to the case body and retains the dial in place.

Up till the present time the bracelet of such watches was of flexible plastic material and the connection between the case body and the two strands of the bracelet was brought about by a hinge including a pin and two knuckles, each provided with at least three eyelets. In this arrangement the pin goes through the eyelets of the two knuckles and is force fitted into those of the knuckle attached to the bracelet. Patent document CH 647 917 describes this type of connection. In one example the case body is of the material known as ABS, while the bracelet is an elastomeric material or of PVC. For the case body materials known under the designations ASA or SAN may also be employed. These choices respond perfectly to the criteria which seek at the same time reliability and low production cost, such criteria being, as is well known, determinative in the construction of watches of the type not subject to being disassembled.

However, it has been noted that bracelets provided in accordance with these criteria have a life duration much shorter than that of the watch modules and the present

invention aims to provide a solution to what appears at this point as a problem in conserving the advantages of watches of the type not subject to disassembly.

The research leading to this solution might suggest resort to metallic bracelets of a known type, but the latter necessitate the use of spring bars, the pivots of which are normally attached to lugs on the case body. However, case bodies provided with lugs are difficult to reconcile with manufacture in plastic material. Furthermore, such metallic bracelets may in rubbing against the lugs, wear them out rapidly, this going against the purpose which is here sought, which consists in increasing the normal duration of utilization of a watch made of plastic material.

The first objective of the invention is a bracelet of metallic construction including at least one end intended to be coupled in an articulated manner to a watch case, characterized in that said end includes a knuckle of plastic material exhibiting at least one eyelet intended to receive an articulation pin, said knuckle being confined in a hollow metallic link.

The second object of the invention is a watch including a case body of plastic material and a bracelet including two strands, each bracelet strand being coupled to the case body by a hinge characterized in that the hinge includes a first knuckle which is integral with the case body and of the same material and a second knuckle of plastic material, and in that the bracelet is formed of metal, the second knuckle of the hinge being rigidly fastened to a metallic end piece of the bracelet, said second knuckle being confined in a hollow metallic link.

Hereinafter there will be described by way of example an embodiment of the object of the invention which is illustrated by means of the attached drawings.

- Figure 1 is a partial plan view from below of a watch and of one end of its bracelet;
- figure 2 is a schematic cross-section along line II-II of figure 1;
- figure 3 is schematic cross-section along line III-III of figure 1;
- figure 4 is an exploded perspective view showing the end of the bracelet visible on figure 1.

The watch shown on the drawings includes a case body 1 in one piece formed from plastic material such as one of the materials designated as ABS, ASA or SAN for instance. It includes furthermore a bracelet 2 of which one strand is visible on the drawings. The case body 1 provides the back cover and the caseband in one piece and its inner surface is formed in a manner such as to constitute the cage of the watch, i.e. to support directly all the functional components: oscillator, motor, wheel works, integrated circuit, etc. A dial 3 covers the components. It is held in place by a crystal 4 of plastic material, for instance Plexiglass (registered trademark), which is permanently fastened in a watertight manner, for instance by welding, in an annular hollow 5. The upper surface of the case body is covered by metal cap 6. Such cap is rigidly held in place by crystal 4 by means of a heel 4' extending radially towards the periphery.

At 12 o'clock and at 6 o'clock, the case body 1 exhibits a knuckle formation, i.e. it is provided with

four ribs 7 projecting from its lower side and having a connecting cover 8. The ribs 7 form the eyelets. They are pierced with coaxial circular holes 9 intended to accommodate a hinge pin 10.

As described hereinabove, a watch of this type may have a life duration of several years, for instance five years or even more. The back of the case is generally provided with an opening with a removable cover thus permitting periodic battery changes.

The bracelet 2 coupled to the watch as described is of the metallic type. Included among known metallic bracelets are those having articulated links, extensible bracelets formed of rigid elements coupled by springs, bracelets of metallic tissues, etc. In principle the bracelet for the watch as described may be of any of the known types, that which is shown on the drawing being preferably a bracelet of rigid links coupled by elastic elements. Such links are themselves formed from two segments of thin sheet metal blanked and formed or drawn in a manner to provide cages in which the elastic blades which couple the links to one another are engaged. Thus, on figure 2 and 3, links 11 and 12 of bracelet 2 comprise rigid elements coupled in an extensible manner, but it seems unnecessary to provide here further details thereof. It is necessary nevertheless to mention that link 12 includes a lug 12a on its side adjacent link 14. The function of such lug will be set out in detail hereinafter.

There remains to be described the last link 14 of each of the strands of bracelet 2. This link includes two sheet metal elements 15 and 16 and a knuckle 17. These

elements 15 and 16 and knuckle 17 are shown on figure 4 before they have been assembled. The two elements 15 and 16 are initially blanked and partially formed and drawn in a manner to be adapted for assembly to one another by a bending operation.

More precisely, the upper element 15 exhibits three humped portions 15a, 15b and 15c on its upper face, a flap 15d on the edge intended to be adjacent link 12, two lateral tongues 15e, one only of which is visible on the drawing and three knuckle tabs 15f.

The two lateral edges of element 16 each comprise a cut out 16c into which tongues 15e are engaged.

The lower element 16 exhibits a plane surface of generally rectangular form. The longitudinal sides include on the one hand a tongue 16a, on the other a struck up flange 16b, both of which extend perpendicular to the planar surface. Tongue 16a is intended to be adjacent a link 12.

Knuckle 17 is of plastic material, advantageously of an elastic material chosen from among those generally employed for the manufacture of plastic bracelets. It includes three coaxial eyelets 17a of width greater than that of the tabs 15f. Each of these eyelets is pierced with a hole 17b, holes 17b being coaxial and of a diameter slightly less than that of the pin 10. The lower face of the knuckle 17 is provided with a rectilinear groove 17e perpendicular to the lateral edges of the bracelet. Finally, the upper face of the knuckle includes two humped portions 17c and 17d having substantially the same form as the humped portions 15b and 15c of element 15.

The assembly of link 14 and its attachment to the remainder of the bracelet is accomplished by means of a jig not shown on the drawing. Element 16 is initially set out flat in a manner such that tongue 16a and flange 16b are turned upwardly. The bracelet is next put into place with lug 12a hooking into tongue 16a. The knuckle 17 is placed over element 16 straddling flange 16b, this latter being engaged in groove 17e. Finally, element 15 covers the knuckle 17 and the element 16 in a manner such that the flap 15d is aligned with tongue 16a such that the two tongues 15e are engaged in the cut outs 16c and that the humped portions 15c and 15b are respectively aligned over the humped portions 17c and 17d of knuckle 17. The jig is then operated in order to fold the two tongues 15e and the three tabs 15f. More precisely, tongues 15e are folded under the lower face of element 16 while the tabs 15f are brought to match the form of eyelets 17a.

The assembly of the bracelet as thus realized with the case is brought about by meshing of eyelets 17a within the spaces comprised between the eyelets 7 of the case in a manner such that the holes 9 are coaxial with holes 17b and thereupon engaging pin 10 in holes 9 and 17b. Such pin 10 is retained by elastic clamping of the material of knuckle 17.

Should case 1 be provided with a cap 6, it will be noted that the watch is protected to a great extent by the metallic parts which improve the appearance on a long term basis. Furthermore, the connection of the metallic bracelet and the case remains simple, economic and without risking premature wear by the metallic bracelet

of the lugs or the eyelets of the plastic case. Furthermore, in view of the tabs 15f, the portion of the bracelet of plastic material which is mechanically the weakest, is substantially reinforced.

In the watch as described, the hinge includes several eyelets, both on the bracelet and the case. Should the material of the case be sufficiently rigid, it is likewise possible to envisage the employment of a standard known structure with lugs and spring bars. Even here it is possible to employ a bracelet according to the invention. In such instance the essential function of the knuckle is that of avoiding wear of the case lugs by the bracelet when the material of such lugs is softer than that of the bracelet metal.

To obtain the ends of the bracelet, it would likewise be possible to manufacture the knuckles by direct moulding onto an assembled bracelet, the latter being introduced into a mould before the plastic material was injected therein.

In a simplified solution, it would likewise be possible to eliminate element 16 and to assure the fastening of element 15 by folding back the tongues and the tabs directly onto the knuckle 17. In this case the function of tongue 16a would be fulfilled by another tongue integral with element 15. Furthermore, the knuckle 17 could be elongated to the proximity of such tongue in order to assure blocking of lug 12a.

CLAIMS

1. Bracelet of metallic construction (2) including an end (14) intended to be hingedly coupled to a watch case (1), characterized in that said end includes a hinge knuckle of plastic material (17) presenting at least one eyelet (17a) adapted to accomodate a hinge pin (10), said hinge knuckle being confined within a hollow metallic link.

2. Bracelet according to claim 1, characterized in that the hollow metallic link is made up of two metallic plate segments (15, 16) bent or swaged onto one another, such link being hinged and/or coupled in an extensible manner to the rest of the bracelet.

3. Bracelet according to claim 2, characterized in that the hinge knuckle of the bracelet exhibits a transversal groove (17e) in which is retained a folded flange (16b) of one of said plate segments (16).

4. Bracelet according to claim 2, characterized in that it is formed of a set of links of similar appearance to one another, hinged to one another or coupled in an extensible manner to one another and in that said hollow metallic link is of appearance similar to the other links.

5. Bracelet according to any one of claims 2 to 4, characterized in that one of the segments (15) making up the hollow metallic link includes at least one tab (15f) and in that each eyelet is at least partially covered by a tab.

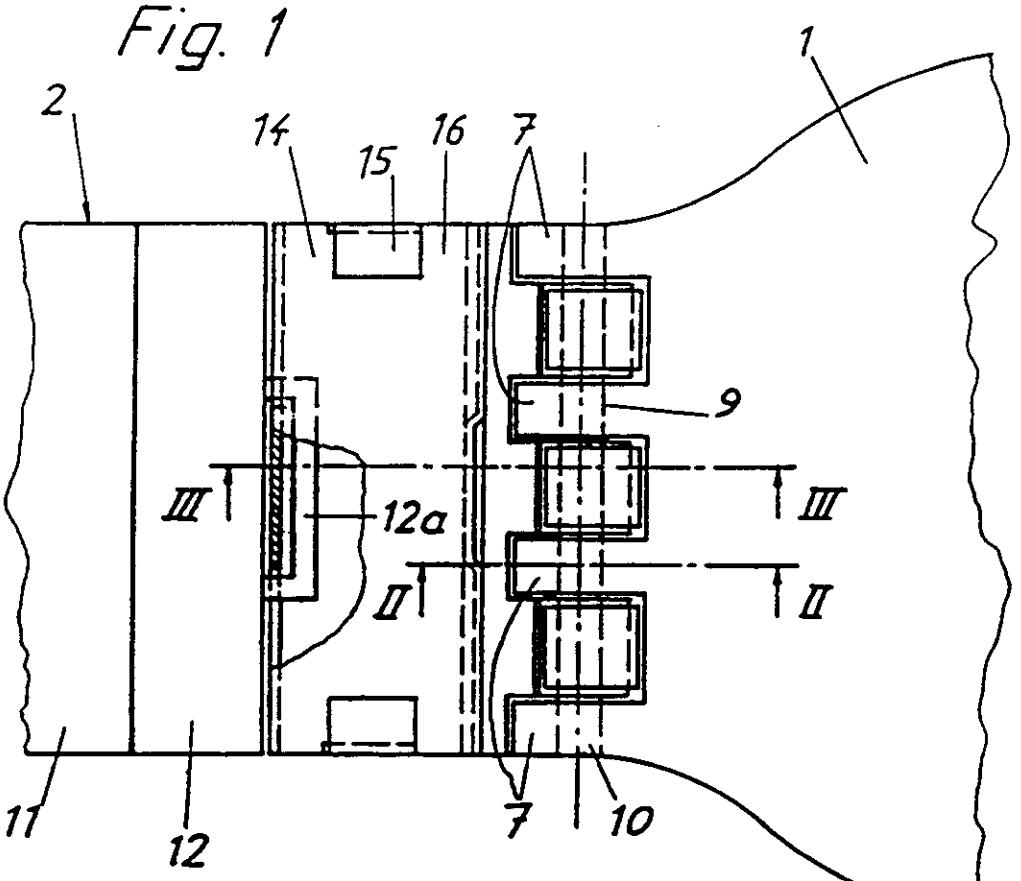
6. Bracelet according to any one of claims 1 to 5, characterized in that the hinge knuckle is provided with at least two coaxial eyelets.

7. Watch including a case body of plastic material and a bracelet according to claim 1, which includes two strands, and each of which (2) is coupled to the case body by a hinge, characterized in that the hinge includes a first hinge knuckle integral with the case body and formed of the same material and a second hinge knuckle (17), of plastic material, and in that the bracelet is of metal, the second hinge knuckle being rigidly fixed to a metallic end part (12) of the bracelet, said second hinge being confined within a hollow metallic link.

8. Watch according to claim 7, characterized in that the second hinge knuckle (17) is of elastic plastic material and in that a hinge pin (10) is rigidly fixed by clamping to said second hinge knuckle.

9. Watch according to claim 7, characterized in that the case body is overlaid with a metallic cap.

Fig. 1



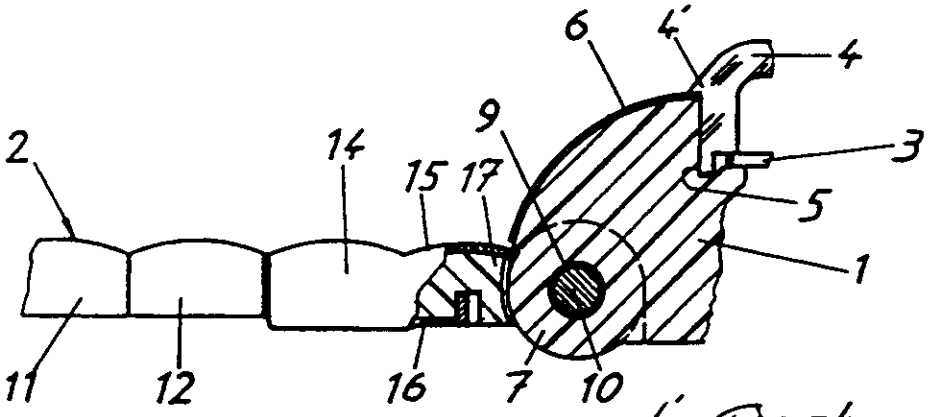


Fig. 2

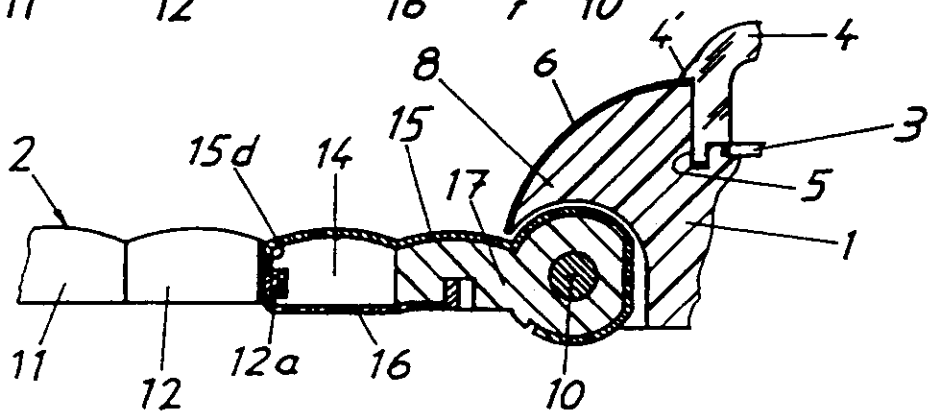
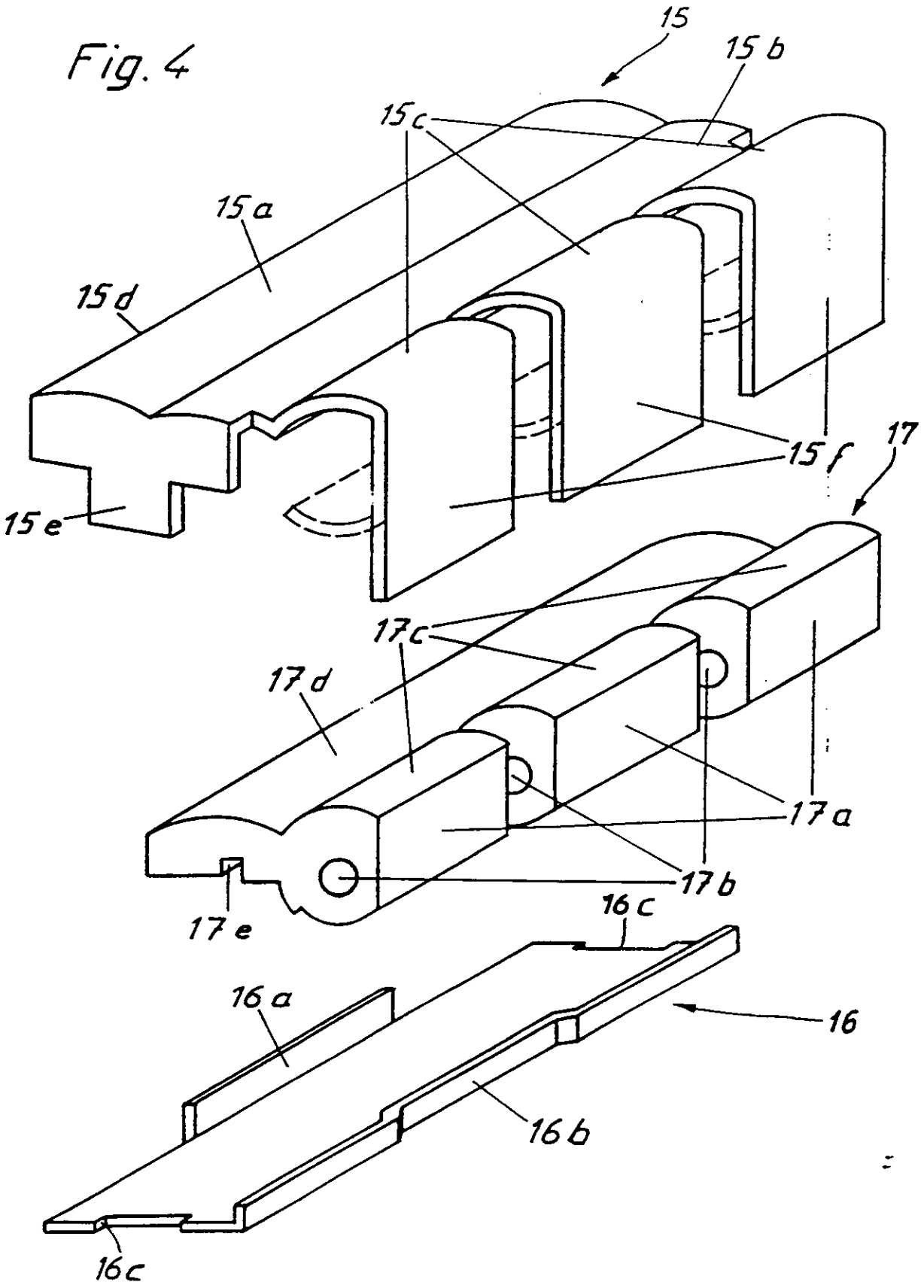


Fig. 3

Fig. 4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