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(54) **JEWELRY AND ITS MANUFACTURING PROCESS**

(57) Described is a piece of jewellery (1), for the jewellery, goldsmith and silversmith sector, comprising a core (2) made of a metal alloy with a shape memory, for supporting a covering (3) made of precious metal.

The core (2) extends along a direction of extension (X) in such a way as to substantially follow a portion of a spiral curve.

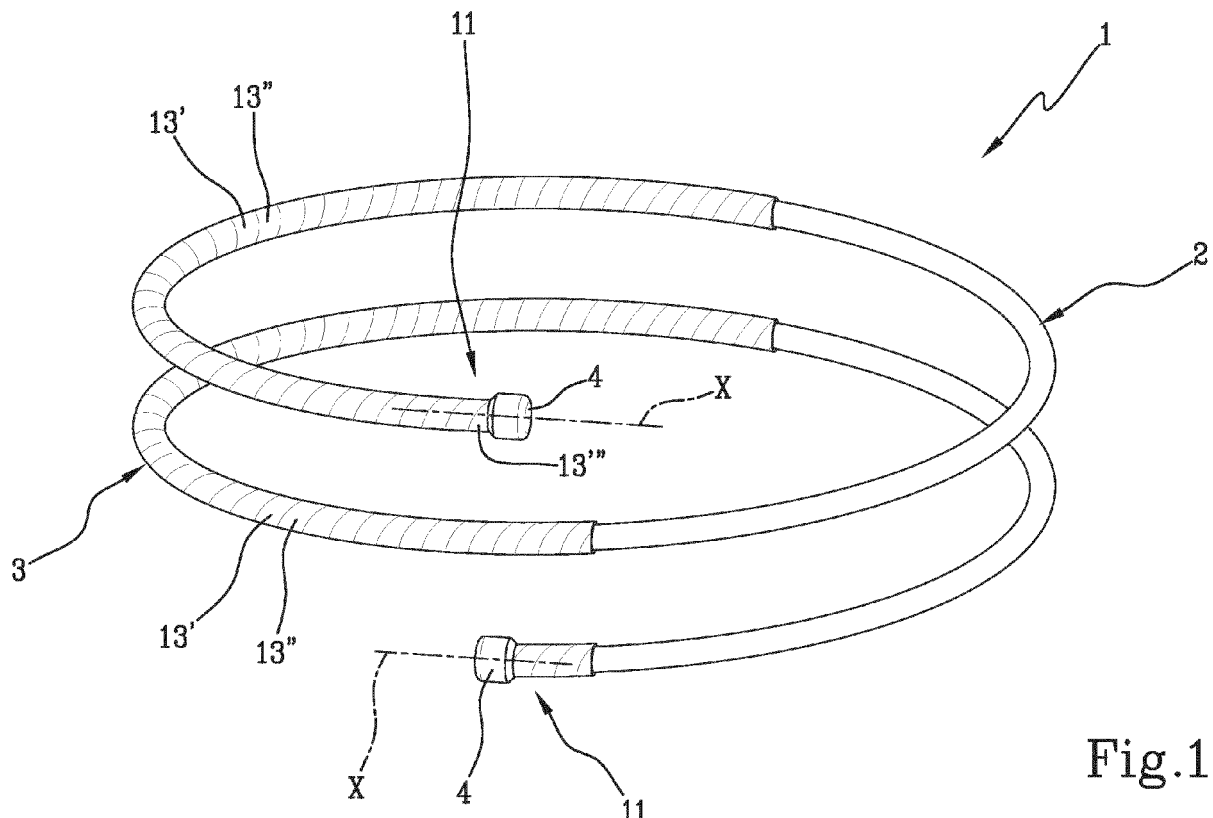


Fig.1

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Description

[0001] This invention relates to a piece of jewellery, particularly for the jewellery, goldsmith and silversmith sector and to its manufacturing process.

[0002] In the current state of the art, goldsmith's, silversmith's and costume jewellery products are available on the market, known as omega or omega-shaped bracelets, from the shape of the last letters of the Greek alphabet: that is to say, a circular curve with an open portion to allow the user to wear the piece of jewellery.

[0003] This device does not, therefore, have an opening or closing mechanism but is worn simply by widening the omega which, elastically, returns to the initial position once the user stops forcing it.

[0004] One problem with these bracelets is due to the fact that, in the goldsmith's or silversmith's sector, they cannot be manufactured with thin thicknesses, such as, for example, wires with a negligible cross-section relative to the length, due to the poor elastic memory of precious alloys.

[0005] The purpose of the invention is to overcome the above-mentioned drawbacks of prior art types of jewellery, particularly for the jewellery, goldsmith and silversmith sector, which allows a piece of gold or silver jewellery to be manufactured in a substantially wire-like shape.

[0006] In the context of the above-mentioned purpose, an aim of the invention is to provide a wire-like piece of jewellery which can be used as an omega-shaped bracelet, without opening or closing means, but which is resistant and long-lasting.

[0007] Another aim of the invention is to allow a piece of jewellery to be manufactured as an alternative to prior art pieces of jewellery.

[0008] Yet another aim of the invention is to provide a piece of jewellery, particularly for the jewellery, goldsmith and silversmith sector, with means which are readily available on the market and using materials of common use, in such a way that the device is economically competitive.

[0009] This purpose, as well as these and other aims, which are described in more detail below, are achieved by the piece of jewellery, particularly for the jewellery, goldsmith and silversmith sector, according to the invention, comprising the technical features described in one or more of the appended claims. The dependent claims correspond to possible different embodiments of the invention.

[0010] Further features and advantages of the invention are more apparent in the detailed description below, with reference to a preferred, non-limiting embodiment of the piece of jewellery, particularly for the jewellery, goldsmith and silversmith sector, illustrated by way of example and without limiting the scope of the invention, with the aid of the accompanying drawings, in which:

Figure 1 is a perspective view of a piece of jewellery

1 according to the invention, cut in half along an axis normal to the direction of extension X;

Figure 2 illustrates a detail of the piece of jewellery 11.

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[0011] The above-mentioned drawings show a preferred embodiment of a piece of jewellery, particularly for the jewellery, goldsmith and silversmith sector, according to the invention, which is identified in its entirety with the numeral 1 and which comprises a core 2 made of a metal alloy with a shape memory, for supporting a covering 3 made of precious metal. The core 2 extends along a direction of extension X in such a way as to substantially follow a portion of a spiral curve.

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[0012] Preferably, the metal alloy is titanium-based.

[0013] According to a variant, the metal alloy is made of steel, that is to say, made of an iron-carbon alloy.

[0014] Preferably, the metal alloy is of the biocompatible type.

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[0015] Advantageously, the metal alloy has a recovered deformation of between 5% and 10%, inclusive, preferably between 7% and 9.5%, inclusive, more preferably between 8% and 9%, inclusive, even more preferably substantially equal to 8.5%.

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[0016] With reference to Figure 1, the covering 3 comprises a metal sheet wound around said core 2.

[0017] The metal sheet is wound around said core 2 in the form of turns 13', 13", 13''' having a winding angle A of between 5° and 20°, inclusive, preferably between 7° and 18°, inclusive, more preferably between 10° and 17°, inclusive, even more preferably between 12° and 15°, inclusive. Where the winding angle A is a portion of plane between the direction of winding of a turn 13', 13", 13''' and the normal Z relative to the direction of extension X passing through the centre C of the spiral curve (Figure 2). Advantageously, the turns 13', 13", 13''' of the covering 3 are positioned on the core 2 in such a way that each of them has at least one perimeter edge 13a in contact with the next turn: obviously, the end turns 13''' will have a single edge 13a in contact with that of the turn next, the other turns 13" both the edges 13a.

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[0018] In other words, two adjacent turns are in contact only by means of the respective perimeter edges 13a, without a sheet superposing the next one, not even partly.

[0019] Advantageously, there are abutting means for the covering 3 on the core 2.

[0020] Preferably, the locking means 4 comprise an abutment element 4 designed to be connected to each end 11 of the piece of jewellery 1 and which has a relative housing compartment 5 for the corresponding end portion 2a of the core 2 and for the relative end part 3a of the covering 3. More specifically, the abutment element 4 comprises a cap 4, substantially tubular, closed in its outermost part, that is to say, on the opposite side relative to the compartment 5, by a thickness 14.

[0021] According to the preferred embodiment, the abutment element 4 is associated with the covering 3, for example by means of soldering.

[0022] A second crucial aspect of the invention relates to the process for making the above-mentioned piece of jewellery.

[0023] The process comprises the following steps:

- winding the sheet of precious metal, for example, preferably with a thickness less than or equal to 0.2 mm, around the metal core, in such a way as to tighten the core inside the sheet, all in a rectilinear manner;
- shaping the sheet wound on the core, using suitable equipment and fixing the ends of the core;
- hardening everything in the predetermined form, using temperatures and hardening times in relation to the masses and volumes of the objects to be hardened, in such a way as to obtain products which maintain over time the shape received during the hardening steps, even if subjected to twisting of more than 360°.

[0024] These products also have a greater compactness and have the core integral with the shell.

[0025] A variant embodiment of this process consists in:

- constructing an outer covering shell having a passage for a core made of titanium alloy;
- inserting the core inside the above-mentioned shell;
- hardening everything in the predetermined form, using temperatures and hardening times in relation to the masses and volumes of the objects to be hardened, in such a way as to obtain products which maintain over time the shape received during the hardening steps, with greater compactness and which have the core integral with the shell.

[0026] In practice, the temperatures and the hardening times are selected according to the masses and volumes of the objects to be hardened; these objects, once hardened, maintain over time the shape received during the hardening steps even if subjected to twisting of more than 360° are also more compact and the titanium alloy core is integral with the covering shell.

[0027] Advantageously, the metal core is made of titanium alloy, preferably of nitinol, a metal alloy of per se known type which guarantees a shape memory of the object.

[0028] Alternatively, the core is made of a shape memory alloy (SMA) of any known type.

[0029] Advantageously, the insertion of the core inside the shell is very simple, since the whole occurs in a rectilinear manner, that is to say, the metal core is inserted in a substantially rectilinear direction.

[0030] This production process allows a piece of jewellery to be obtained which, if subjected to twisting or bending, is able to fully recover (100%) the initial form (shape memory).

[0031] From the above description it may be seen how

the invention achieves the preset purpose and aims and in particular it should be noted that a piece of jewellery is manufactured, particularly for the jewellery, goldsmith and silversmith sector, which allows a piece of gold or silver jewellery to be manufactured in a substantially wire-like shape.

[0032] More specifically, the titanium steel core gives the piece of jewellery the shape memory which allows it to be used without the use of opening or closing means, that is to say, like an omega-shaped bracelet.

[0033] Another advantage of the invention is due to the fact that the metal core is particularly resistant and long-lasting, guaranteeing a long life to the piece of jewellery and an excellent efficiency of use.

[0034] Another advantage of such a piece of jewellery is that it represents a valid and welcome alternative in a sector which is very often repetitive, thus providing a good commercial boost.

[0035] A further advantage of the invention is due to the fact that with the manufacturing process according to the invention, it is possible to use very thin thicknesses of the precious metal, even less than a tenth of a millimetre, thus allowing the low-cost production of a piece of jewellery made of gold alloy or silver.

[0036] Lastly, the use of means which are easily available on the market and the use of common materials makes the device economically competitive. The invention can be modified and adapted in several ways without thereby departing from the scope of the inventive concept.

[0037] Moreover, all the details of the invention may be substituted by other technically equivalent elements.

[0038] In practice, the materials used, as well as the dimensions, may be of any type, depending on requirements, provided that they are consistent with their production purposes.

Claims

1. A piece of jewellery (1) for the jewellery, goldsmith and silversmith sector comprising a core (2) made of a metal alloy with a shape memory, for supporting a covering (3) made of precious metal; said core (2) extending along a direction of extension (X) in such a way as to substantially follow a portion of a spiral curve.
2. The piece of jewellery (1) according to the preceding claim, wherein said metal alloy is titanium-based or iron-carbon-based.
3. The piece of jewellery (1) according to claim 1 or 2, wherein said metal alloy is of the biocompatible type.
4. The piece of jewellery (1) according to any one of the preceding claims, wherein said metal alloy has a recovered deformation of between 5% and 10%,

inclusive, preferably between 7% and 9.5%, inclusive, more preferably between 8% and 9%, inclusive, even more preferably substantially equal to 8.5%.

5. The piece of jewellery (1) according to any one of the preceding claims, wherein said coating (3) comprises a metal sheet wound around said core (2). 5
6. The piece of jewellery (1) according to the preceding claim, wherein said metal sheet is wound around said core (2) in the form of turns (13', 13'', 13''') having a winding angle (A) of between 5° and 20°, inclusive, preferably between 7° and 18°, inclusive, more preferably between 10° and 17°, inclusive, even more preferably between 12° and 15°, inclusive; said winding angle (A) being between the direction of winding of a turn (13', 13'', 13''') and the normal (Z) relative to said direction of extension (X) passing through the centre (C) of said spiral curve. 10 15 20
7. The piece of jewellery (1) according to the preceding claim, wherein each of said turns (13', 13'', 13''') has at least one perimeter edge (13a) in contact with the next turn. 25
8. The piece of jewellery (1) according to the preceding claim, wherein two adjacent turns (13', 13'') are in contact only by means of the respective perimeter edges (13a). 30
9. The piece of jewellery (1) according to any one of the preceding claims, comprising locking means (4) for said covering (3) on said core (2).
10. The piece of jewellery (1) according to the preceding claim, wherein said locking means (4) comprise an abutment element (4) designed to be connected to each end (11) of the piece of jewellery (1) and having a relative housing compartment (5) for the corresponding end portion (2a) of said core (2) and for the relative end part (3a) of said covering (3). 35 40
11. The piece of jewellery (1) according to the preceding claim, wherein said abutment element (4) comprises a substantially tubular cap (4) closed in its outermost part by a thickness (14). 45
12. The piece of jewellery (1) according to any one of claims 10 or 11, wherein said abutment element (4) is associated with said covering (3). 50
13. A process for making a piece of jewellery for the jewellery, goldsmith and silversmith sector, **characterised in that** it comprises the steps consisting of: 55
 - winding a sheet of precious metal around a metal core, in such a way as to tighten said core inside the sheet;

- shaping said sheet wound on said core;
- hardening everything in the predetermined form, using temperatures and hardening times in relation to the masses and volumes of the objects to be hardened, in such a way as to obtain products which maintain over time the shape received during the hardening steps, even if subjected to twisting of more than 360°.

14. A process for making a piece of jewellery for the jewellery, goldsmith and silversmith sector, **characterised in that** it comprises the steps consisting of:

- constructing an outer covering shell having at least one passage for a core made of titanium alloy;
- inserting said core inside said shell;
- hardening everything in the predetermined form, with temperatures and hardening times in relation to the masses and volumes of the objects to be hardened, in such a way as to obtain products which maintain over time the shape received during the hardening steps, even if subjected to twisting of more than 360°.

15. The process according to the preceding claim, wherein said core is inserted in said shell in a substantially rectilinear direction.

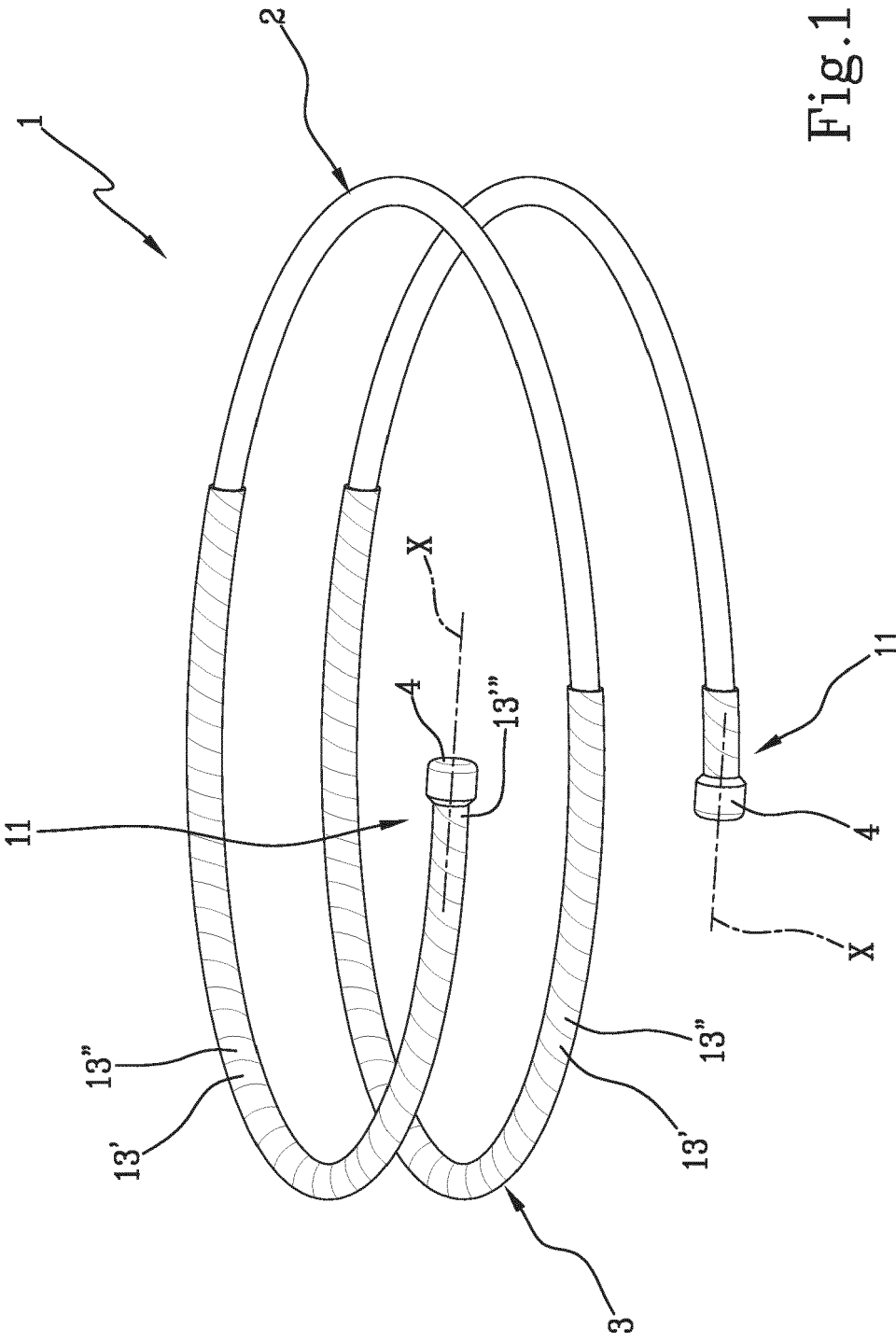


Fig. 1

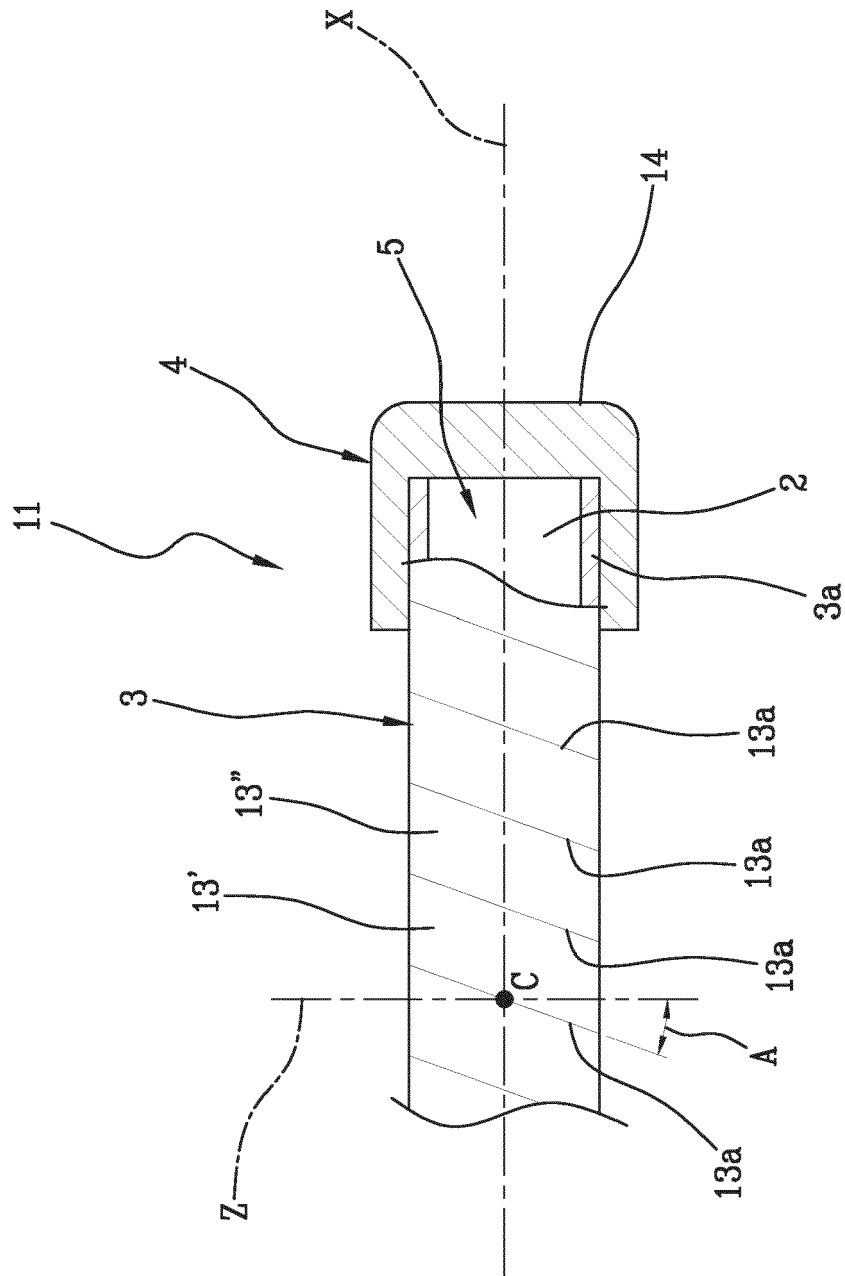


Fig. 2



EUROPEAN SEARCH REPORT

Application Number

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EPO FORM 1503 03.82 (P04C01)

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Y	* Description; figures *	5-8	A44C5/12
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			TECHNICAL FIELDS SEARCHED (IPC)
			A44C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 20 February 2023	Examiner Gallego, Adoración
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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20-02-2023

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