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Office européen des brevets



11 Publication number:

0 534 060 A1

12

EUROPEAN PATENT APPLICATION

21 Application number: **92109526.1**

51 Int. Cl.⁵: **D01H 13/04**, B65H 57/08,
B65H 57/06, B21D 53/18

22 Date of filing: **05.06.92**

30 Priority: **24.09.91 IT MI912531**

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43 Date of publication of application:
31.03.93 Bulletin 93/13

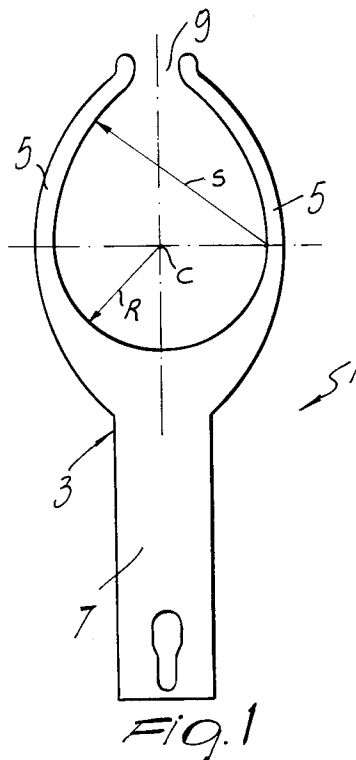
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84 Designated Contracting States:
CH DE ES FR GB IT LI

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54 Method for manufacturing yarn guiding rings.

57 A method for manufacturing yarn guiding rings, includes a first step of blanking a plate (3) to form a plate body (1) constituted by a supporting element (7) and by a fork element, and a second step of bending the fork in order to obtain a circular ring. The fork element has two arms (5). Each arm is constituted by two portions with different curvatures (R, S). The outer portions of the arms are folded until the curvatures are all identical, producing a circle with radius (R) and overlapping the free ends of the arms. The yarn guiding ring is thus constituted by a single blanked and bent part with a solid cross-section.



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The present invention relates to a method for manufacturing yarn guiding rings, particularly used in spinning machines.

The spinning machines have yarn guiding rings whose function is well-known and will not be described herein for brevity. The guiding rings are generally constituted by a ring of metallic wire welded to a supporting plate which is configured according to the requirements.

The ring is open in order to allow the insertion of the yarn, and its ends overlap so that the yarn encounters a perfectly circular and uninterrupted internal circumference. Furthermore, the internal finish of the rings must be extremely accurate in order to prevent the deterioration and breakage of the yarn going through the ring at a very high speed.

A known method for manufacturing yarn guiding rings comprises: forming a ring by bending a metallic wire, blanking a supporting plate, welding the plate to the ring, and finally performing the required surface treatments, such as trimming, polishing, chromium plating, etc.

This method has been used for a long time, it has however some disadvantages.

First of all, the method is expensive, because of the welding operation, and because it requires a long production time and specialized personnel.

Another severe disadvantage is that the welding operation is unhealthy.

As regards the quality of the finished product, there is also the possibility that the ring may break at the welding point due to the vibrations to which it is subjected during use.

A yarn guiding ring executed monolithically by blanking and bending a metal plate has recently been introduced. The advantage of this type of execution is its relatively lower production cost, with respect to the welded ring. However, the execution of this type of ring entails an apparatus which is very complicated and still expensive, due to the number and type of dies required, as well as scarcely flexible as regards the possibility of producing rings of various sizes and types, unless expensive modifications of the dies are carried out.

The aim of the present invention is to provide a process for manufacturing yarn guiding rings which is effectively simpler and more economical than known methods.

Within the scope of this aim, an object of the invention is to provide a manufacturing process which avoids the welding operation.

Still another object is to provide a process according to which the finishing operations are simplified and can be performed with ordinary machines.

This aim, these objects and others which will become apparent hereinafter are achieved by a

process for manufacturing yarn guiding rings, characterized in that it comprises the steps of:

a) forming a plate which comprises a fork element having two arms, each of said arms comprising a first portion having a first radius of curvature and a second portion having a second radius of curvature, said first radius of curvature being substantially equal to the radius of curvature of the finished ring; said second radius of curvature being substantially greater than said first radius of curvature, each of said arms having a free end, said free ends being formed with a certain distance between one another;

b) bending said arms so as to at least partially overlap said free ends and so as to reduce said second radius of curvature substantially to the dimensions of said first radius of curvature.

Further characteristics and advantages will become apparent from the description of a preferred but not exclusive embodiment of the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a plan view of a formed body prior to the bending operation for obtaining the ring according to the invention;

Figure 2 is a front view of the formed body of Figure 1;

Figure 3 is a plan view of the ring formed from the body of Figure 1, according to the invention;

Figure 4 is a front view of the ring of Figure 3;

Figures 5-8 are views, respectively identical to Figures 1-4, of a further example of embodiment of a ring manufactured according to the invention;

Figure 9 is a partial sectional view, taken along the line IX-IX of figure 3;

Figure 10 is a side view of the ring illustrated in Figures 5-8.

With reference to the above figures, the method according to the invention initially comprises the step of forming a plate body 1, in one piece, by blanking a metal plate 3 of adequate thickness.

The formed body 1 is constituted by a fork element having a supporting element 7.

The supporting element 7 is substantially a flat strip which may have different shapes and dimensions according to the design requirements of the machine to which the yarn guiding ring will be applied.

The fork element comprises two arms 5: each arm 5 is constituted by a first portion, having a radius of curvature R , and by a second portion, having a radius of curvature S greater than the radius R .

Advantageously, the radius of curvature R is substantially the final internal radius of curvature of the finished yarn guiding ring.

As more clearly illustrated in Figure 2, the free ends of the arms 5 are advantageously offset, with respect to the plane of the formed body, at the open region 9 of the fork element.

The second step of the ring manufacturing process comprises the preparation and/or finishing of the surfaces, such as the blending of the edges and the elimination of burr.

The third step of the process, according to the invention, comprises the operation of bending the arms 5, which substantially affects the second portions with radius S, so as to form a perfect circle with a radius R and thus the finished yarn guiding ring 10.

The free ends of the arms are overlapped, as more clearly illustrated in Figure 4, in the region 19 in order to allow the insertion of the yarn, as per se known in the operation of the spinning machines.

The ring 10 may optionally be subjected to a surface treatment such as for example chromium plating.

Figures 5-8 illustrate a yarn guiding ring 110 which is provided with a Z-shaped supporting plate. Elements similar to those of Figures 1-4 are indicated, in Figures 5-8, by the same numerals increased by 100.

In this case also, a formed body 101, in one piece, is obtained from a metallic plate 103 and is then subjected to the particular bending operation of the arms 105, as described above.

In practice it has been observed that the invention achieves the intended aim and objects by providing a monolithic yarn guiding ring, therefore without welds, and with blanking and bending operations which do not require particularly complicated or expensive dies.

The peculiarity of the invention resides in the configuration of the arms of the formed body 1, 101, which has allowed to obtain a ring with a perfect internal profile, of radius R, by means of a relatively simple operation such as bending.

The ring 10, 110 thus obtained has better mechanical characteristics than rings manufactured according to known processes. The possibility of breakage at the point of connection (welding) between the ring itself and the supporting plate is in fact eliminated.

The weight of the ring manufactured according to the invention, for equal characteristics and according to the thickness of the plate, is lower than in rings manufactured with prior art methods.

Another advantage of the invention is the significant reduction in labour, since almost all the operations can be performed automatically.

Furthermore, the elimination of acetylene oxide welding makes the work environment healthier.

The process according to the invention is susceptible to numerous modifications and variations,

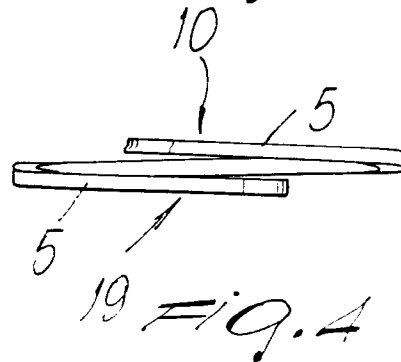
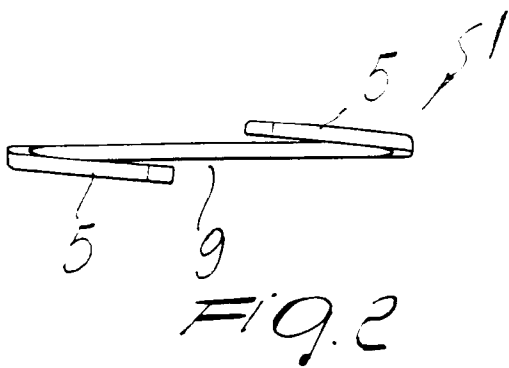
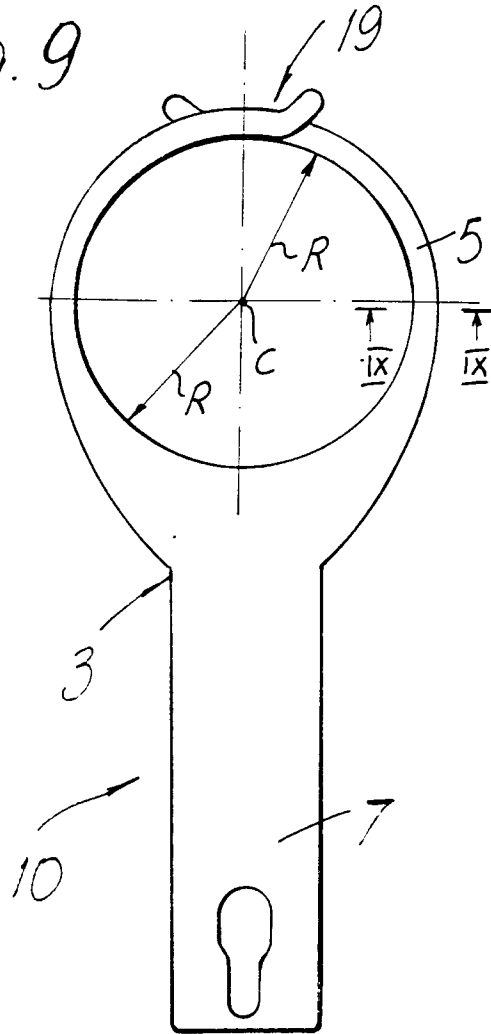
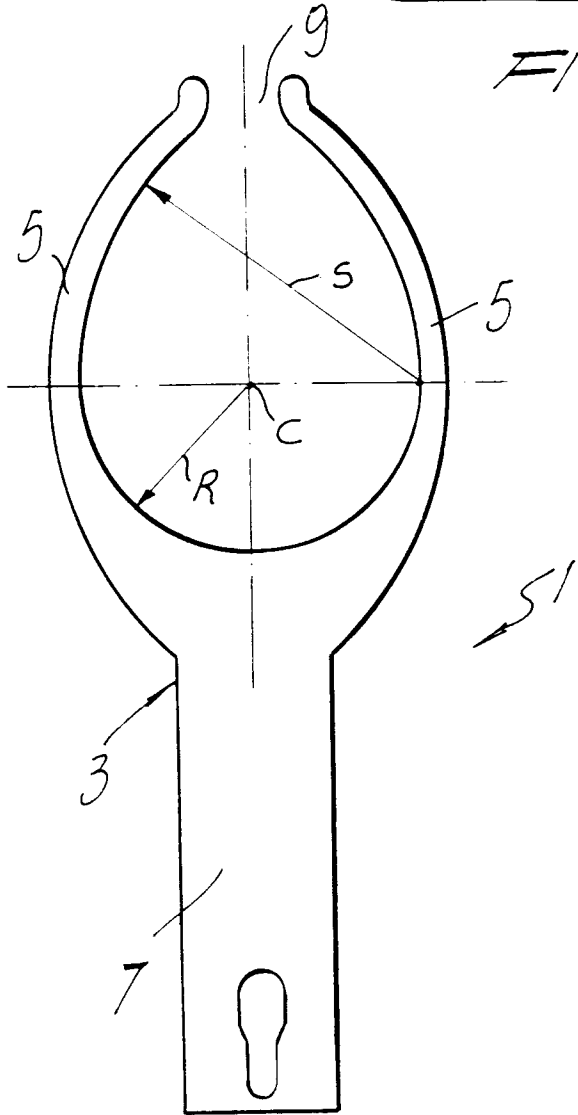
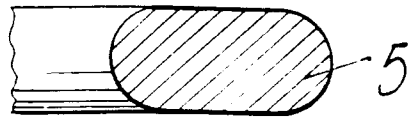
all of which are within the scope of the inventive concept; all the details may furthermore be replaced with technically equivalent elements.

The materials employed, as well as the dimensions, may naturally be any according to the requirements and the state of the art.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Method for manufacturing yarn guiding rings (10, 110), characterized in that it comprises the steps of:
 - a) forming a plate body (1, 101) comprising a fork element having two arms (5, 105), each of said arms comprising a first portion having a first radius (R) of curvature and a second portion having a second radius (S) of curvature, said first radius of curvature being substantially equal to the radius of curvature of the finished ring; said second radius of curvature being substantially greater than said first radius of curvature, each of said arms having a free end, said free ends being spaced apart (9, 19, 109, 119);
 - b) bending said arms so as to at least partially overlap said free ends and so as to reduce said second radius of curvature substantially to the dimensions of said first radius of curvature.
2. Method according to claim 1, characterized in that said step of forming said plate body (1, 101) comprises an operation of blanking a metallic plate (3, 103).
3. Method according to claim 1 or 2, characterized in that a step for the surface machining of said ring is comprised between said plate forming and bending steps.
4. Process according to one or more of the preceding claims, characterized in that it comprises a step of chromium plating said ring (10, 110).



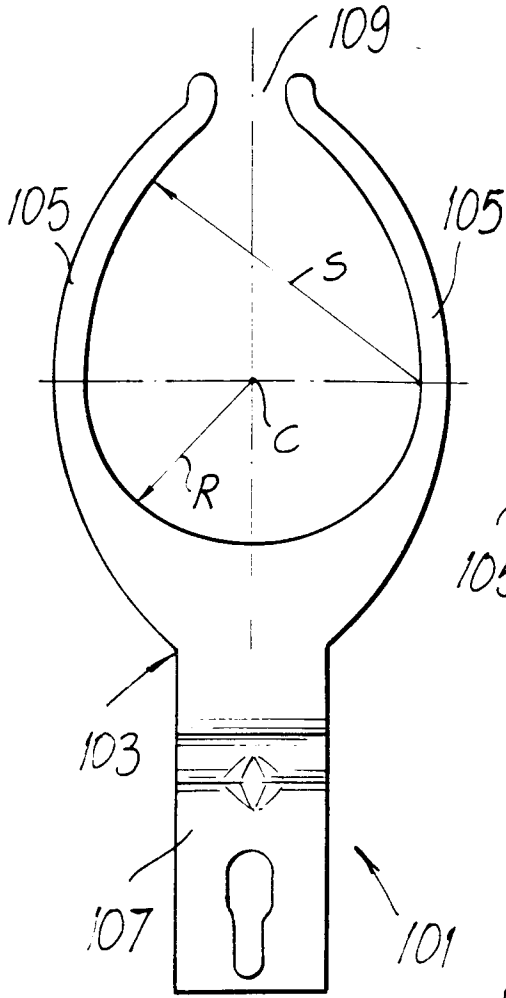


Fig. 5

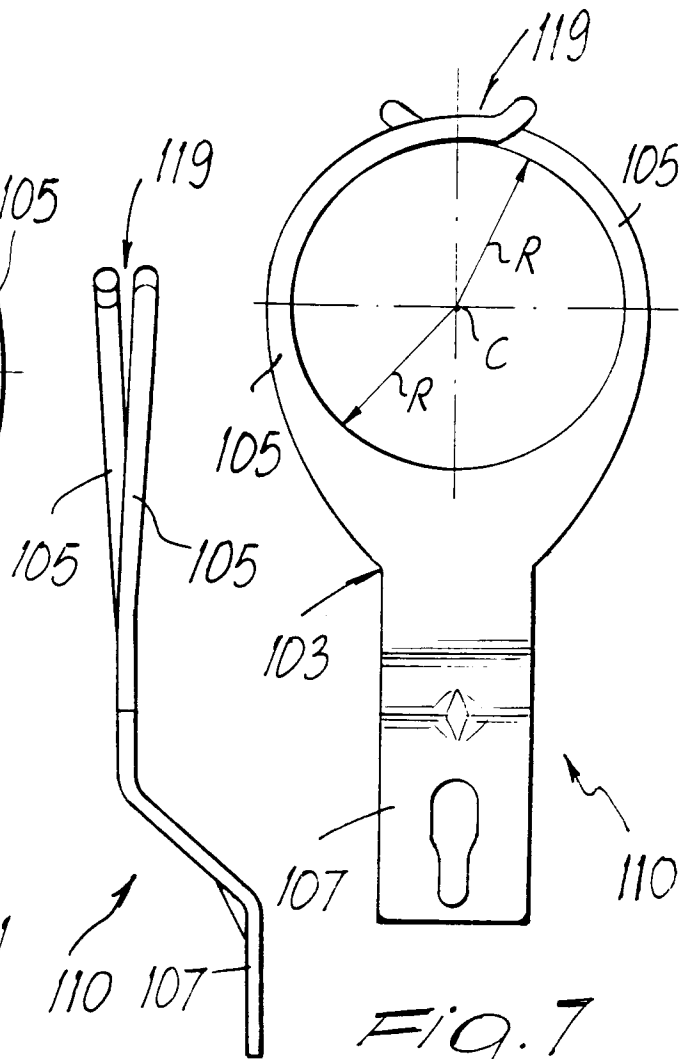


Fig. 10

Fig. 7

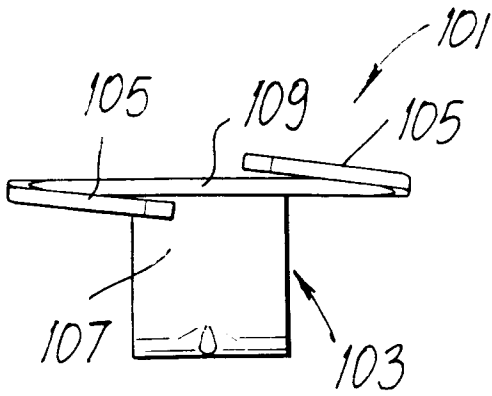


Fig. 6

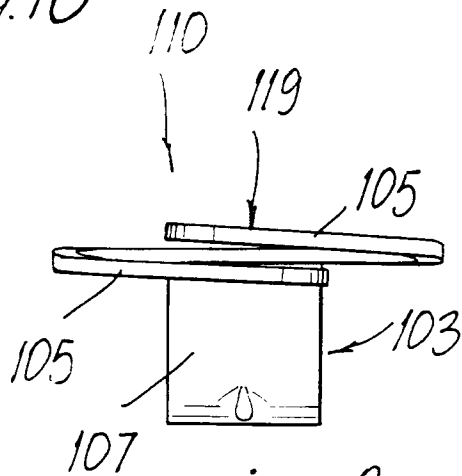


Fig. 8



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EUROPEAN SEARCH REPORT

Application Number

EP 92 10 9526

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	DE-A-3 520 864 (HACOBA TEXTILMASCHINEN) ---		D01H13/04 B65H57/08
A	FR-A-2 587 044 (SKF TEXTILMASCHINENKOMPONENTEN) ---		B65H57/06 B21D53/18
A	DE-U-1 707 599 (PROSS) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			D01H B65H B21D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 07 JANUARY 1993	Examiner RAYBOULD B.D.J.
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