(Continued on next page)

(54) Title: SPIRAL CASING DEVICE

Fig. 1 

(57) Abstract: A spiral casing device (1) for a fluid machine in which the flow area of the spiral casing (1) changes along the flow path of the spiral casing (1) and in which the spiral casing (1) is provided with an opening (22) extending radially inwards, the spiral casing (1) being polygonal in cross section and each side being formed by a plate portion (6, 8, 10, 12, 14, 16, 18, 20), the number of sides being larger than four.
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SPIRAL CASING DEVICE

A spiral casing is provided. More particularly, it is a spiral casing for a fluid machine, in which the flow area of the spiral casing changes along the flow path of the spiral, and in which the spiral casing is provided with an opening extending radially inwards.

Spiral casings for fluid machines are found in a great number of dimensions and designs. In the construction of spiral casings of this kind, importance is primarily attached to achieving the highest hydraulic efficiency possible at an acceptable cost.

Smaller spiral casings may be cast to achieve a smooth change in the flow area along the flow path, whereas larger spiral casings are often formed as plate constructions, the spiral casing being welded up from rolled plate segments. Spiral casings constructed in this way exhibit considerably improved efficiency in relation to spiral casings formed with a rectangular, for example square, cross section.

Spiral casings built from rolled plate segments are relatively expensive to manufacture.

The invention has for its object to remedy or reduce at least one of the drawbacks of the prior art.

The object is achieved, according to the invention, through
the features which are specified in the description below and in the claims that follow.

A spiral casing is provided for a fluid machine, in which the flow area of the spiral casing changes along the flow path of the spiral casing, and in which the spiral casing is provided with an opening extending radially inwards, the spiral casing being characterized by the spiral casing being polygonal in cross section, each side being formed by a plate portion, the number of sides being larger than four.

Another aspect of the spiral casing is that more than four of the plate portions extend continuously around the spiral casing. Preferably, all plate portions extend continuously around the spiral casing. It is obvious that available plate dimensions could mean that plate portions will need to be joined.

When the number of sides in the cross section of a spiral casing exceeds four, the forming of the sides is substantially complicated. Thus, it has not been natural to a person skilled in the art to construct spiral casings with more than four continuous plate sides. If better efficiency is desirable, said segmented plate portions are used.

A further aspect of the spiral casing is that at least one of the plate portions is given a conical shape.

A further aspect of the spiral casing is that each plate portion is sealingly connected to neighbouring side edges along mutual contact lines.

Yet another aspect of the spiral casing is that each plate portion is connected to the neighbouring plate portion by means of a welding seam.
The spiral casing provided exhibits a considerable improvement in hydraulic efficiency compared with known spiral casings producible at a comparable cost. Known plate-working methods, for example laser cutting and controlled plate rollers, enable prefabrication of relatively accurate plate portions which may subsequently be joined mechanically.

The hydraulic efficiency of the spiral casing is comparable to that of corresponding spiral casings with a circular cross section.

In what follows is described an example of a preferred embodiment which is visualized in the accompanying drawings, in which:

Figure 1 shows schematically in perspective a spiral casing with an inlet; and

Figure 2 shows a section I-I of figure 1.

In the drawings the reference numeral 1 indicates a spiral casing including a ring portion 2 and a connection pipe 4. The connection pipe 4 forms an inlet pipe in the casing of a turbine and an outlet pipe in the casing of a pump.

In this embodiment, the ring portion 2 comprises eight continuously tapering plate portions 6, 8, 10, 12, 14, 16, 18, 20 forming sides in the cross section of the spiral casing 1, see figure 2.

The first plate portion 6 is slotted to provide a radial inward opening 22 from the ring portion 2. The opening 22 is defined by two ring plates 24. The ring plates 24 may form a guide housing.

In the same way as the ring portion 2, the connection pipe 4 is formed of continuous plate components 26. The plate compo-
Components 26 are formed in such a way that the cross section of the connection pipe 4 continuously passes from being circular at the free end portion 28 of the connection pipe 4 into a polygonal cross section corresponding to the cross section of the ring portion 2 at the connecting region between the ring portion 2 and the connection pipe 4, the ring portion 2 and connection pipe 4 also having been adapted to each other to provide a hydrodynamically favourable geometry.

The plate portions 6, 8, 10, 12, 14, 16, 18, 20, ring plates 24 and plate components 26 are connected to each other by means of welded joints.
Patent claims

1. A spiral casing device (1) for a fluid machine in which the flow area of the spiral casing (1) changes along the flow path of the spiral casing (1), and in which the spiral casing (1) is provided with an opening (22) extending radially inwards, characterized in that the cross section of the spiral casing (1) is polygonal, each side being formed by a plate portion (6, 8, 10, 12, 14, 16, 18, 20), the number of sides being larger than four.

2. The device in accordance with claim 1, characterized in that more than four of the plate portions (6, 8, 10, 12, 14, 16, 18, 20) extend continuously around the spiral casing (1).

3. The device in accordance with claim 1, characterized in that at least one of the plate portions (6, 8, 10, 12, 14, 16, 18, 20) is given a conical shape.

4. The device in accordance with claim 1, characterized in that each plate portion (6, 8, 10, 12, 14, 16, 18, 20) is sealingly connected to neighbouring plate portions along mutual contact lines.

5. The device in accordance with claim 1, characterized in that the plate portions (6, 8, 10, 12, 14, 16, 18, 20) are connected to the neighbouring plate portion (6, 8, 10, 12, 14, 16, 18, 20) by means of a welded joint.
A. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC) or to both national classification and IPC

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

D. Further documents are listed in the continuation of Box C

**See patent family annex**

1. Special categories of cited documents

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2. Date of the actual completion of the international search: 5 June 2009

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4. Name and mailing address of the ISA:
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   - NL - 2280 HV Rijswijk
   - Tel (+31-70) 340-2040,
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5. Authorized officer:
   - Ingelbrecht, Peter
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