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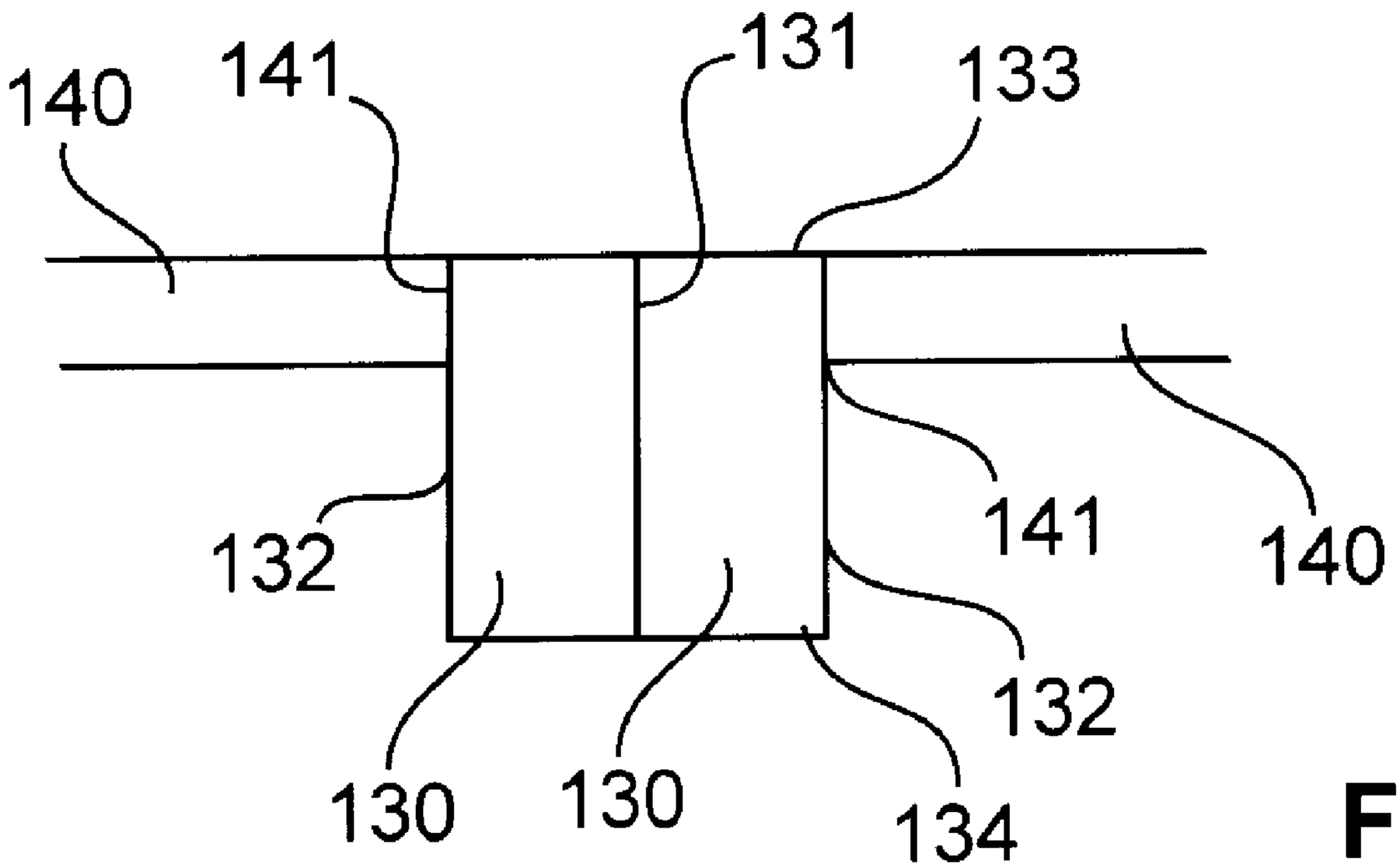

Fig. 2

(57) Abrégé/Abstract:
The invention relates to a wind energy plant tower, comprising a plurality of tower segments, each of which is provided with an upper and a lower horizontal flange (120, 110). At least one of the plurality of tower segments is provided with at least two longitudinal flanges (130). Each longitudinal flange is provided with a first side (131) for abutting a first side of an additional longitudinal flange, and with a second side (132), to which the shell surface (140) is welded, wherein the second side (132) is located opposite the first side (131).

Abstract

There is provided a wind power installation pylon comprising a plurality of pylon segments which respectively have an upper and a lower horizontal flange (120, 110). At least one of the plurality of the pylon segments has at least two longitudinal flanges (130). Each longitudinal flange has a first side (131) for bearing against a first side of a further longitudinal flange and a second side (132) to which the peripheral surface (140) is welded, wherein the second side (132) is opposite to the first side (131).

(Figure 2)

Wind energy plant tower

The present invention concerns a wind power installation pylon.

The pylons of wind power installations are typically made up from pylon segments, the pylon segments typically representing prefabricated parts. The segments are typically conical or cylindrical. The pylon segments can be made either from steel or concrete. The higher a pylon of a wind power installation is intended to be, the correspondingly larger is the base surface area of the lower pylon segments. The dimensions of the lower pylon segments however are limited by the transport options.

EP 1 606 514 B1 shows a pylon of a wind power installation having a number of cylindrical or conical pylon portions or pylon segments. The pylon portions or pylon segments can have a respective horizontal flange at the upper and lower ends. In addition thereto vertical flanges can be provided so that a pylon segment can be divided in the longitudinal direction. The vertical flanges are fixed on the inside of a peripheral surface of the pylon portions so that the peripheral surfaces of the pylon portions touch each other at their connecting locations. The vertical flanges are welded onto the inside of the peripheral surface and are displaced with respect to the ends of the peripheral surfaces by a spacing so that spacer elements can be provided between the adjacent vertical flanges.

DE 60 2005 002 760 T2 shows a pylon of a wind power installation. The pylon comprises prefabricated metal wall parts which each have two longitudinal flanges.

DE 101 52 018 A1 shows a pylon of a wind power installation comprising a plurality of segments, wherein the segments each have at least one horizontally oriented flange.

WO 2010/134029 A1 shows a pylon of a wind power installation, having a plurality of segments, wherein the segments each have at least two longitudinal flanges.

US No 7 770 343 B2 shows a pylon of a wind power installation, which can be made up from a plurality of segments, the segments each having longitudinal flanges.

An object of the present invention is to provide a pylon of a wind power installation, which has improved statics even when the pylons are very high.

That object is attained by a wind power installation pylon according to claim 1.

Thus there is provided a wind power installation pylon which is constructed from a plurality of pylon segments which respectively have an upper and a lower horizontal flange. At least one of the segments has at least two longitudinal flanges (which are oriented vertically). Each of the longitudinal flanges has a first contact surface which is in contact with a contact surface of another longitudinal flange. The peripheral surfaces of the pylon segments are welded onto the second contact surface of the longitudinal flanges, that is opposite to the first one. Accordingly the ends of the peripheral surfaces of the pylon segments do not touch each other but they are coupled together by way of the longitudinal and vertical flanges respectively.

That is advantageous as the longitudinal flanges can be manufactured separately from the peripheral surfaces, with a very high level of accuracy, so that two longitudinal flanges can be fixed to each other with very good fitting accuracy. That is in turn advantageous in regard to the statics of the entire pylon. According to the invention the longitudinal flanges and the peripheral surfaces of the pylon segments are not produced in one piece but separately from each other. It is only then that the peripheral surfaces can be welded to the second contact surfaces of the longitudinal flanges.

In an aspect of the invention the longitudinal flanges have a third side which is visible outwardly.

In an aspect there is provided a groove in one of the longitudinal flanges. The longitudinal flanges can be fixed to each other for example by means of screws.

In an aspect of the invention the peripheral surface is substantially flush with the third side.

Further configurations of the invention are subject-matter of the appendant claims.

Advantages and embodiments by way of example of the invention are described in greater detail hereinafter with reference to the drawing.

Figure 1 shows a sectional view of a pylon segment of a wind power installation pylon according to a first embodiment,

Figure 2 shows a diagrammatic cross-section through the pylon segment in the region of the longitudinal flanges according to a first embodiment,

Figure 3 shows a diagrammatic sectional view through a portion of the pylon segment according to the first embodiment,

Figure 4 shows a diagrammatic sectional view through a portion of a pylon segment according to a second embodiment, and

Figure 5 shows a diagrammatic sectional view through a pylon according to a third embodiment.

Figure 1 shows a sectional view through a pylon segment of a wind power installation pylon according to a first embodiment. The pylon can comprise a multiplicity of pylon segments 100 which are stacked or arranged one upon the other. The pylon segment 100 has a lower horizontal flange 110, an upper horizontal flange 120, two longitudinal flanges 130 and a peripheral surface 140 which extends between the upper and lower flanges 120, 110 and the two longitudinal flanges 130. The pylon segment can thus consist of two halves which have respective longitudinal flanges 130. By means of the longitudinal flanges 130, the one half of the pylon segment 100 can be fixed to the other half of the pylon segment with corresponding longitudinal flanges 130. The upper and lower flanges 120, 110 serve for fixing further pylon segments to construct a pylon of a wind power installation. The pylon segment can also be divided into more than two parts.

According to the invention the longitudinal flanges 130 are produced separately from the surface 140.

Figure 2 shows a diagrammatic cross-section of the pylon segment in the region of the longitudinal flanges according to a first embodiment. Figure 2 shows two longitudinal flanges 130. The longitudinal flanges have a first (inner) side (a first contact side) 131, a second (outer) side (second contact side opposite the first side) 132, a third (outwardly directed) side 133 and a fourth (inwardly directed) side 134. Two longitudinal flanges 130 respectively bear upon or against each other with their first sides 131 and can be for example screwed together. The peripheral surfaces 140 are fixed (for example welded) with their first end 141 to the second contact side 132 of the flange. Thus the first contact sides 131 of the longitudinal flanges 130 are in contact with each other while the peripheral surfaces 140 are fixed, for example welded, with their first ends 141 to the second contact side 132. This (that is to say the separate manufacture of the longitudinal flanges 130 and the peripheral surfaces) is particularly advantageous because the longitudinal flanges can be very accurately turned or produced in the form of a straight component. Accordingly it is possible to provide very accurate contact surfaces (first side 131) so that the longitudinal flanges can be very well fixed to each other with their first sides.

Figure 3 shows a diagrammatic sectional view through a portion of the pylon segment according to the first embodiment. Each longitudinal flange 130 has a first side 131, a second side 132, a third side 133 and a fourth side 134. The first sides 131 can be produced very accurately. At the second sides 132 (opposite the first side) the peripheral surfaces can be fixed (for example welded) to the flange 130. The flanges can be fixed to each other for example by means of a screw connection.

If two portions of a longitudinally divided pylon segment are fixed to each other by means of the longitudinal flanges 130 then the two longitudinal flanges 130 and the weld locations to the peripheral surfaces 140 can be seen from the outside as the flanges 130 extend to the exterior, that is to say the third sides 133 of the flanges 130 are visible from the exterior.

Figure 4 shows a diagrammatic sectional view through a portion of a pylon segment according to a second embodiment which can be based on the first embodiment. One of the two flanges 130 can have a groove 135 at its first side 131. In addition there can be through holes 136 at the two longitudinal flanges 130 so that the flanges can be fixed together by means of screw connections. The groove 135 can be for example of a depth of 1 to 10 mm. Preferably the depth, width and height of the groove are such that an equilibrium is achieved between the force produced by the screw connections and the force produced by the wind.

Figure 5 shows a diagrammatic sectional view through a pylon according to a third embodiment which can be based on the first or second embodiment. Figure 5 shows a cross-section through a pylon segment with two pylon portions each having a peripheral surface 140 and two longitudinal flanges 130, wherein both the third sides 133 of the longitudinal flanges and also the weld seams between longitudinal flange 130 and peripheral surface 140 are visible from the exterior.

The pylon according to the invention is optionally made from steel, that is to say the pylon segments comprise steel.

CLAIMS

1. A wind power installation pylon comprising

a plurality of pylon segments (100) which respectively have an upper and a lower horizontal flange (120, 110) and a peripheral surface (140),

wherein at least one of the plurality of the pylon segments (200) has at least two longitudinal flanges (130),

and wherein each longitudinal flange (130) has a first side (131) for bearing against a first side (130) of a further longitudinal flange (130) and a second side (132) to which the peripheral surface (140) is welded, wherein the second side (132) is opposite to the first side (131).

2. A wind power installation pylon according to claim 1 wherein the first sides (131) of the longitudinal flanges (130) are at least partially directly fixed to each other, and wherein the longitudinal flanges (130) have a third side (133) which is visible to the exterior.

3. A wind power installation pylon according to claim 1 or claim 2 wherein one of the longitudinal flanges (130) at its first side (131) has a groove (135), wherein the longitudinal flanges (130) have a plurality of through holes (136) for receiving screw connections.

4. A wind power installation pylon according to one of claims 1 to 3 wherein the peripheral surface (140) is substantially flush with the third side (133) of the longitudinal flanges (130).

5. A process for the production of a wind power installation pylon from a plurality of pylon segments, wherein a pylon segment has an upper and a lower horizontal flange (120, 110), a peripheral surface (140) and at least two longitudinal flanges (130), wherein the longitudinal flange has a first and a second side opposite to the first side, comprising the steps:

producing the longitudinal flanges,

welding the peripheral surface to the second side of the longitudinal flanges (130), and

screwing two longitudinal flanges together.

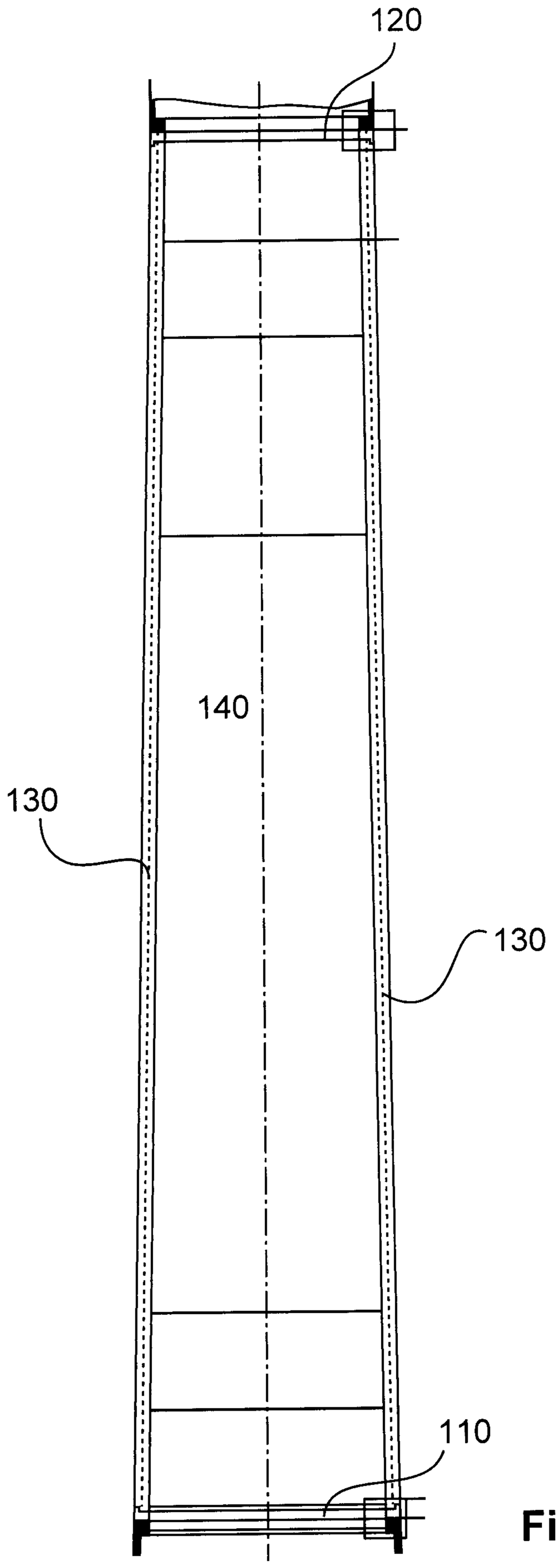

Fig. 1

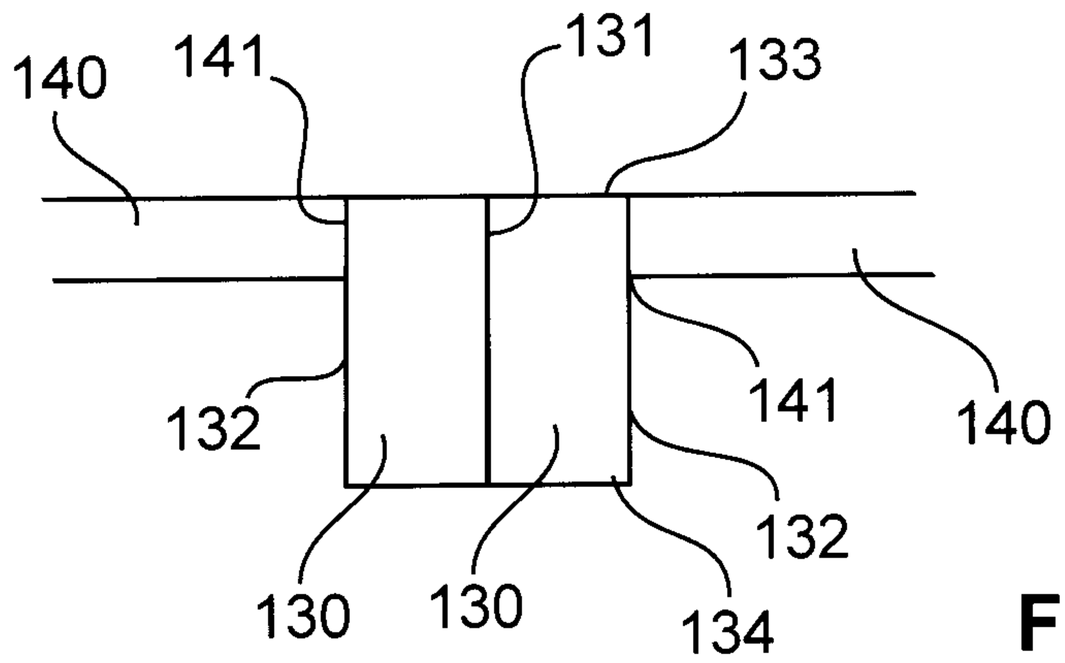

Fig. 2

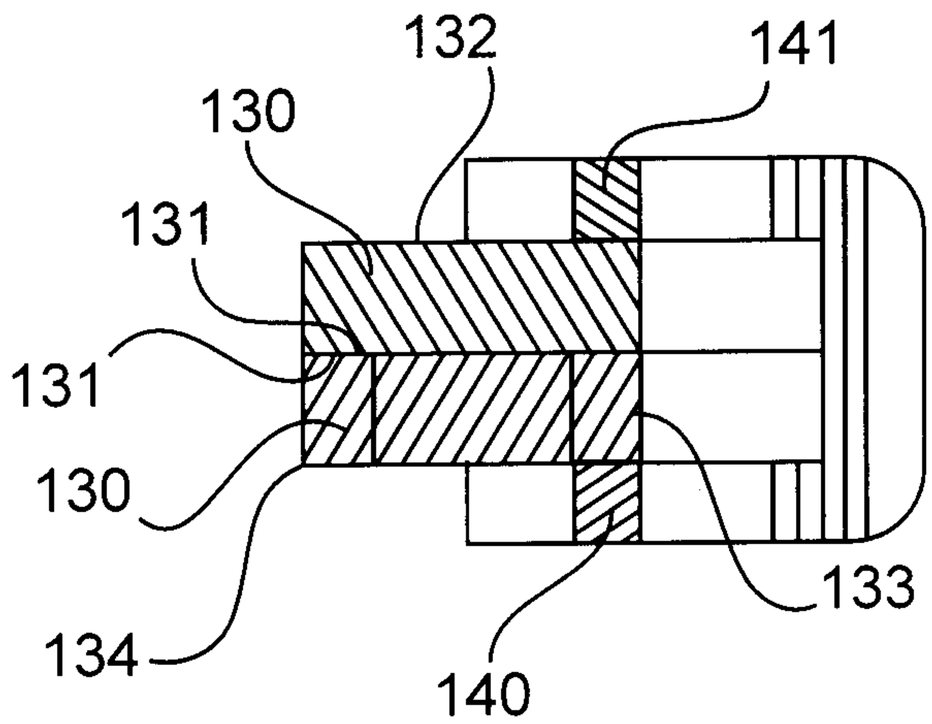

Fig. 3

Fig. 4

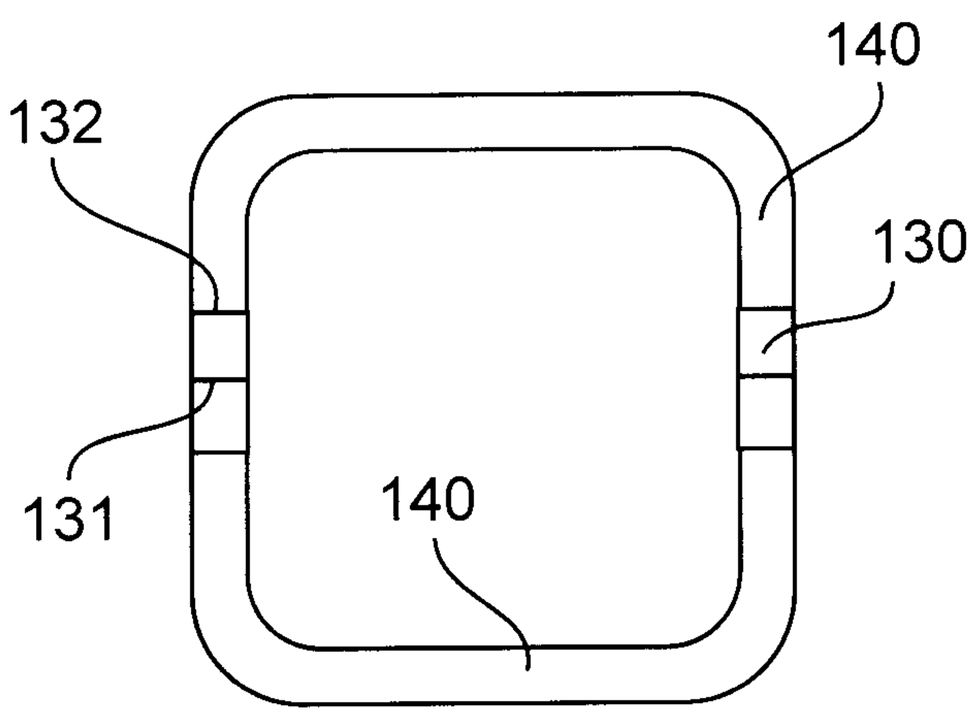

Fig. 5

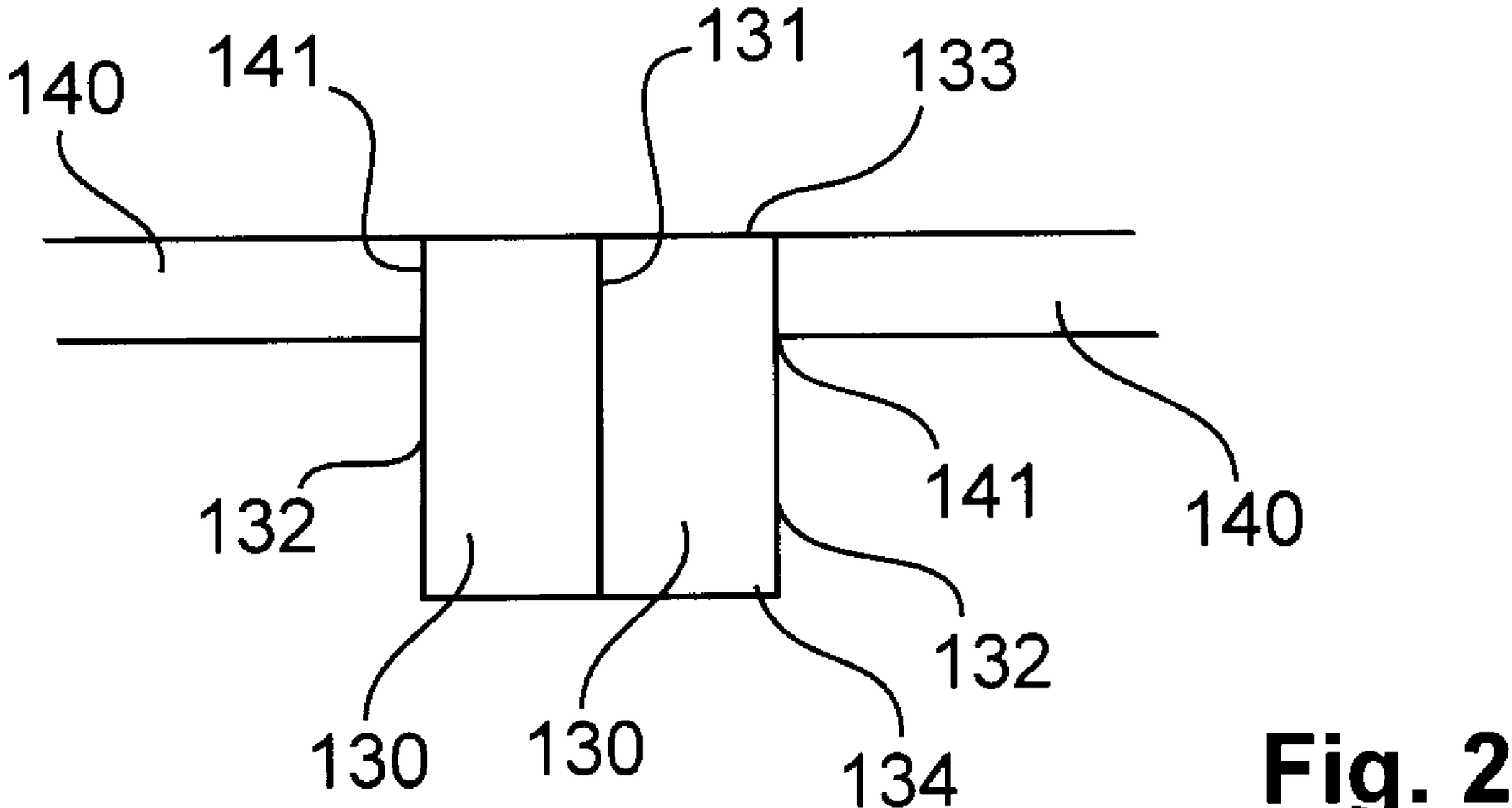

Fig. 2