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(54) SNAP CONNECTOR AND SNAP CONNECTION

(57) In a snap connection (30) a hook (12) is on a protrusion (11) which in turn is attached to an elastic beam (13). To engage a catch (20) of the snap connection

(30), the elastic beam (13) is first deformed and then released. If the hook (12) has engaged the catch (20), an elastic load may remain on the elastic beam (13).

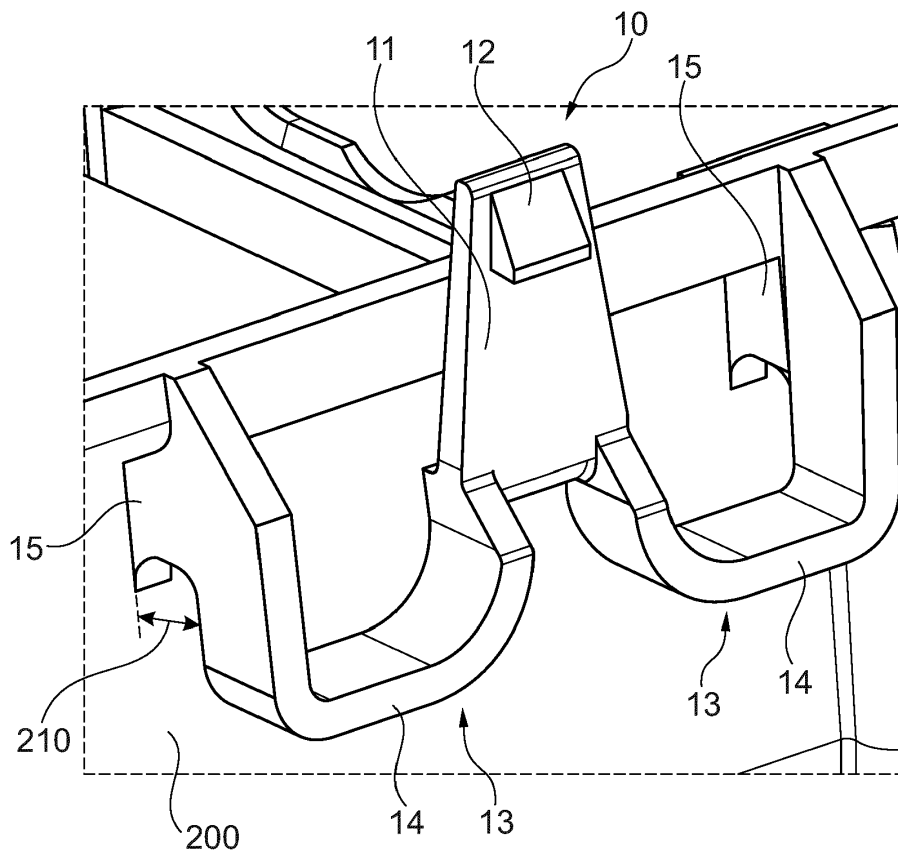


Fig. 2

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Description

[0001] The invention refers to connection of parts, more specifically to connection by snapping.

[0002] A commonly used snap connection has a hook on a protrusion, the hook intended to engage a catch. For this to be possible, a gap between the hook and the catch is required. Such a gap may be unacceptable due to sealing requirements. As there is an, albeit limited, possibility of movement between hook and catch due to the gap, the hook-catch arrangement may be a source of noise. In addition to noise, relative movement between hook and catch, e.g. as a result of vibration of the snap connection, may lead to increased wear. Components of the snap connection, e.g., the hook or the protrusion, may quickly erode to the point of breaking. A snap connection somewhat loose due to the gap may have a resonance frequency significantly lower than a corresponding tight snap connection, i.e. without gap. This lower resonance frequency often is within the frequency range of external mechanical excitations on the snap connection, thus leading to high amplitude oscillatory movement of components of the snap connection, further increasing wear and noise.

[0003] It is an object of the invention to provide a snap connector and a corresponding snap connection which avoid the aforementioned problems.

[0004] This object is achieved by a snap connector according to claim 1 and by a snap connection according to claim 7, respectively. The dependent claims relate to advantageous further embodiments.

[0005] The snap connector according to the invention includes a hook on a protrusion. According to the invention the snap connector also has an elastic beam to which the protrusion is attached.

[0006] The coupling of the protrusion with the hook to the elastic beam adds elasticity to the snap connector and thus to a snap connection when the snap connector is used together with a catch. This elasticity allows engaging between hook and catch without gap, thus avoiding both leakage and a possible source of noise and wear.

[0007] In an embodiment, the elastic beam is oriented perpendicular to the protrusion. This implies that the protrusion can be tilted by a torsion-type deformation of the elastic beam.

[0008] The snap connector may generally be configured such that the elastic beam is at a distance from a surface if the snap connector is attached to the surface. This surface may in particular be a surface of a component of a technical system, which component is to be connected to another component by a snap connection involving the snap connector.

[0009] In an embodiment the distance between the elastic beam and the surface is achieved by at least one distance element by which the snap connector can be attached to the surface. The at least one distance element may in particular be part of the snap connector, and even more specifically may be integral with the snap con-

nector.

[0010] In an embodiment, the elastic beam is divided into two portions, and the protrusion connects the two portions of the elastic beam. In particular, the protrusion, extending perpendicular to the elastic beam, may be arranged between the two portions of the elastic beam and be connected to each portion of the elastic beam.

[0011] An arrangement as just described in an embodiment leads to a "UU"-shape of the snap connector. The two adjacent legs of the Us represent the protrusion, the remaining legs each carry a distance element for attaching the snap connector to a surface, and the bottom line of each U represents one portion of the elastic beam.

[0012] A snap connection according to the invention includes a snap connector according to the invention as described above and a catch, configured such that the hook can engage the catch by first elastically deforming and then releasing the elastic beam. In an advantageous embodiment, the elastic beam is under elastic load if the hook is engaged with the catch.

[0013] So by exerting a force on the elastic beam the protrusion may be tilted and/or shifted, and upon releasing the elastic beam the protrusion will attempt to return into its initial position, the hook thereby engaging the catch and the elastic beam retaining an elastic load. There is no gap between hook and catch and the elastic load retained by the elastic beam keeps hook and catch tightly together.

[0014] The snap connection thus is obviously suitable for situations where a sealed connection is required.

[0015] No undercut on the snap connector is necessary, therefore the snap connector is a part of low complexity, not requiring complex tooling, either.

[0016] Below, the invention and its advantages will be discussed further with reference to the accompanying figures.

Figure 1 shows a prior art snap connection, with gap.

Figure 2 shows a perspective view of a snap connector according to the invention.

Figure 3 shows a further view of the snap connector according to the invention, shown in Fig. 2.

Figure 4 shows a snap connection according to the invention.

[0017] The figures only show specific embodiments of the invention and therefore are not to be construed as a limitation of the invention to the specific embodiments shown.

[0018] Fig. 1 shows a prior art snap connection, with a snap connector 100 and a catch 20. Snap connector 100 has a protrusion 101 with a hook 102, the hook 102 engages catch 20. Between hook 102 and catch 20 there remains a gap 150. Due to the gap 150, the prior art snap connection shown cannot be used if a sealed connection

is required. The gap 150, allowing some relative movement of hook 102 and catch 20, may also lead to noise from and increased wear of the snap connection.

[0019] Fig. 2 shows a snap connector 10 according to the invention, attached to a surface 200. The snap connector 10 has a protrusion 11 with a hook 12. The protrusion 11 is attached to an elastic beam 13, which in the embodiment shown is divided into two portions 14. The two portions 14 are connected by the protrusion 11. The protrusion 11 extends perpendicular to the elastic beam 13. In the embodiment shown, the snap connector 10 has two distance elements 15 as integral parts, by which distance elements 15 the snap connector 10 is attached to the surface 200. As a result, there is a distance 210 between the surface 200 and the elastic beam 13.

[0020] Fig. 3 shows a further view of the snap connector 10 according to the invention, shown in Fig. 2. All elements shown have already been discussed in relation to Fig. 2.

[0021] Fig. 4 shows a snap connection 30 according to the invention, with a catch 20 and a snap connector 10 according to the invention. The snap connector 10 is attached to a surface 200, all elements of the snap connector 10 shown have already been discussed in the context of Fig. 2. Here the hook 12 engages the catch 20, and there is no gap between catch 20 and hook 12. In this state of engagement between hook 12 and catch 20, an elastic load remains on elastic beam 13, ensuring a tight contact between hook 12 and catch 20. Due to distance elements 15, the elastic beam 13 is at a distance 210 from the surface 200.

List of Reference Signs

[0022]

10	snap connector	
11	protrusion	
12	hook	
13	elastic beam	40
14	portion (of elastic beam)	
15	distance element	
20	catch	
30	snap connection	
100	snap connector	45
101	protrusion	
102	hook	
150	gap	
200	surface	
210	distance	50

Claims

1. Snap connector (10) including a hook (12) on a protrusion (11),
characterised by
an elastic beam (13) to which the protrusion (11) is

attached.

2. Snap connector (10) according to claim 1, wherein the elastic beam (13) is oriented perpendicular to the protrusion (11).
3. Snap connector (10) according to claim 1 or 2, wherein the snap connector (10) is configured such that the elastic beam (13) is at a distance (210) from a surface (200) if the snap connector (10) is attached to the surface (200).
4. Snap connector (10) according to claim 3, wherein the snap connector (10) has at least one distance element (15) by which the snap connector (10) can be attached to the surface (200).
5. Snap connector (10) according to one of the claims 1 to 4, wherein the elastic beam (13) is divided into two portions (14), the two portions (14) connected by the protrusion (11).
6. Snap connector (10) according to claim 5, wherein the snap connector (10) has a "UU"-shape.
7. Snap connection (30) including a snap connector (10) according to one of the claims 1 to 6 and a catch (20), the snap connection (30) configured such that the hook (12) can engage the catch (20) by first elastically deforming and then releasing the elastic beam (13).
8. Snap connection (30) according to claim 7, wherein the elastic beam (13) is under elastic load if the hook (12) is engaged with the catch (20).

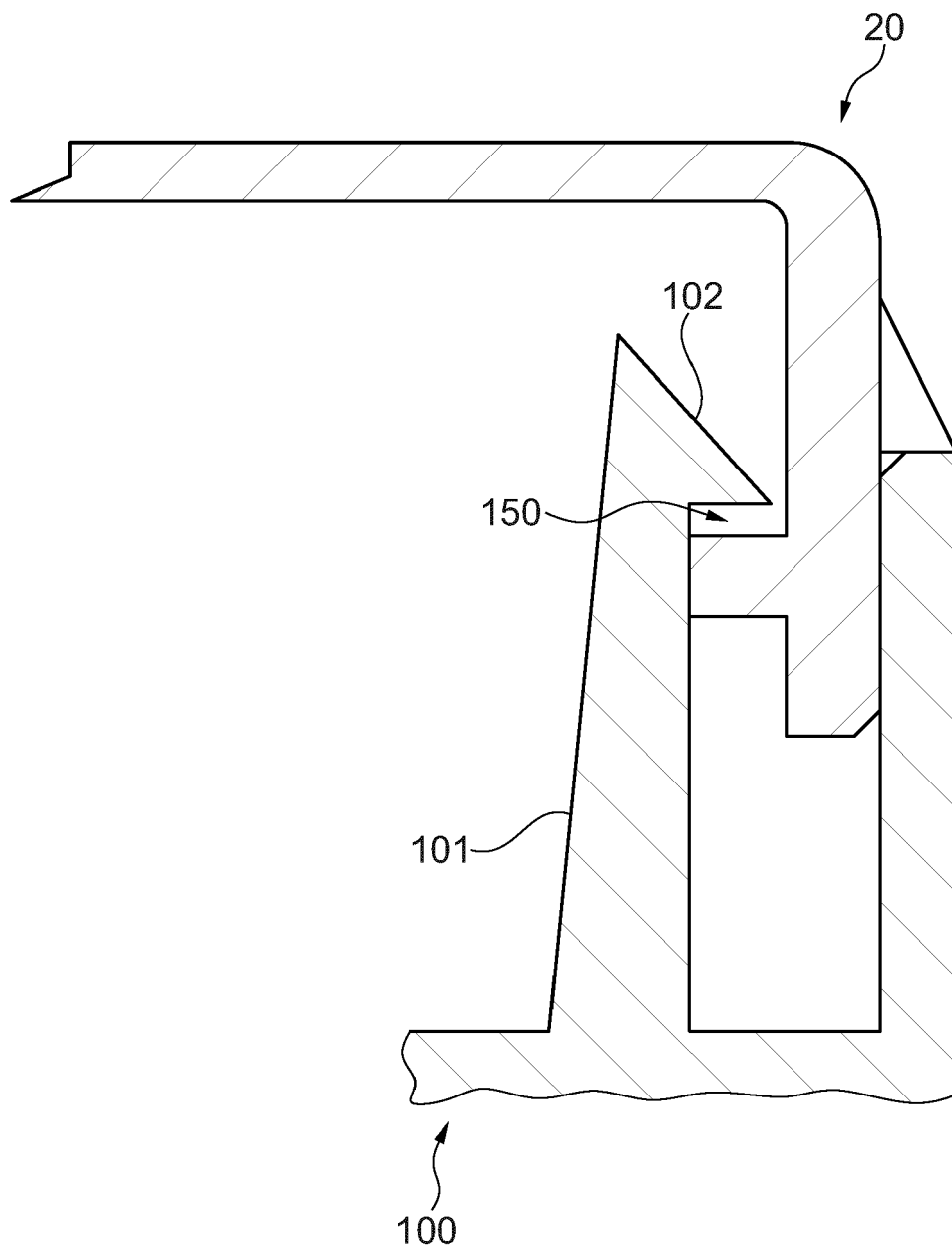


Fig. 1
Prior art

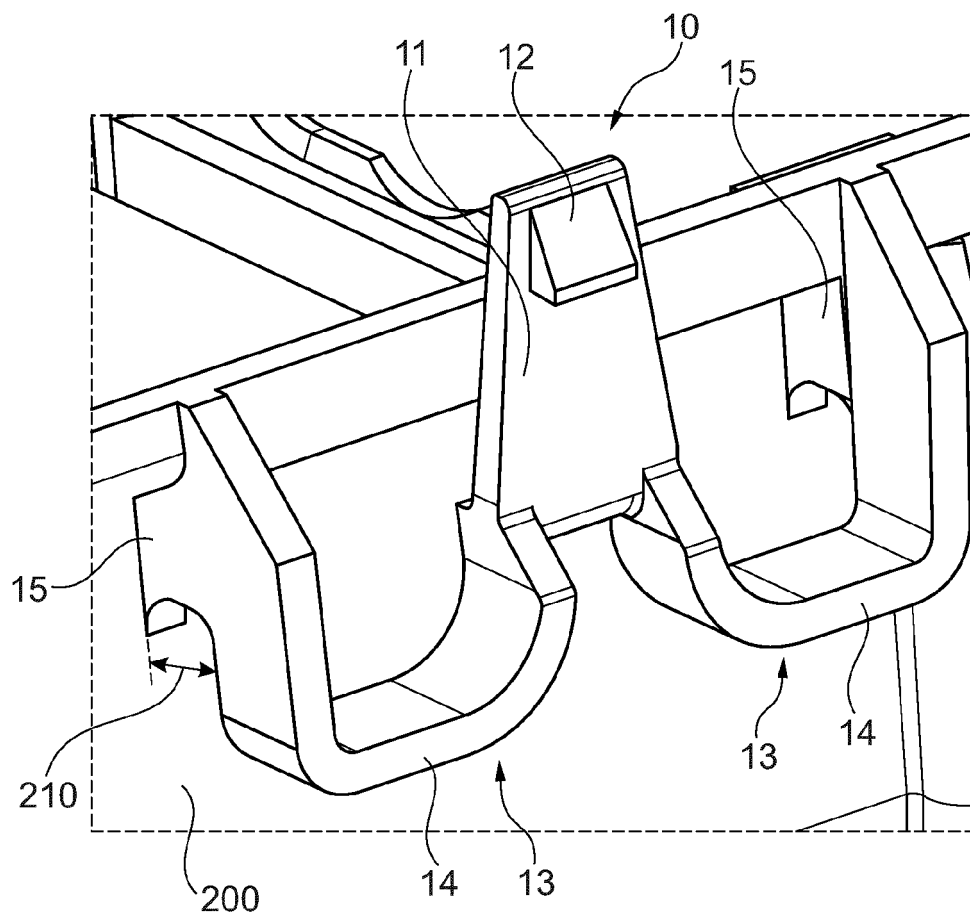


Fig. 2

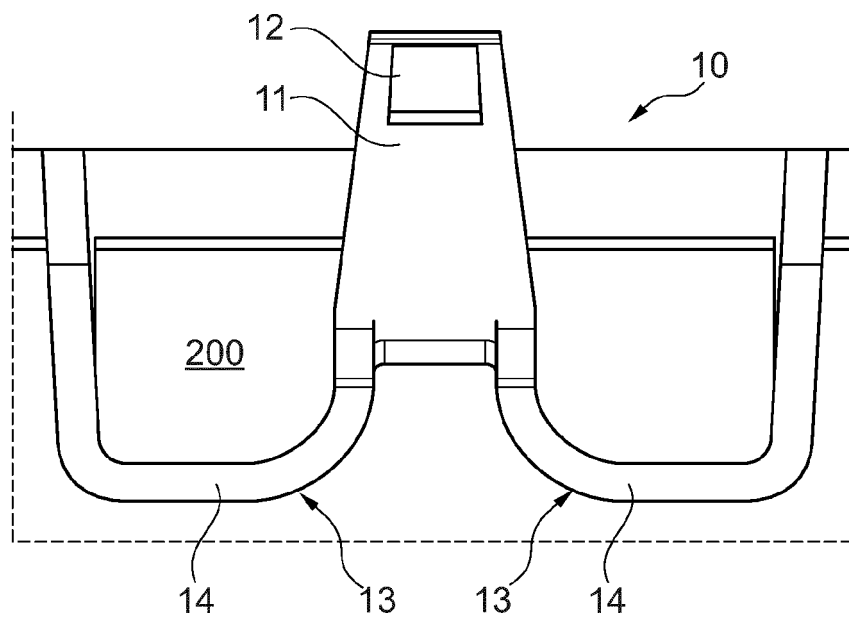


Fig. 3

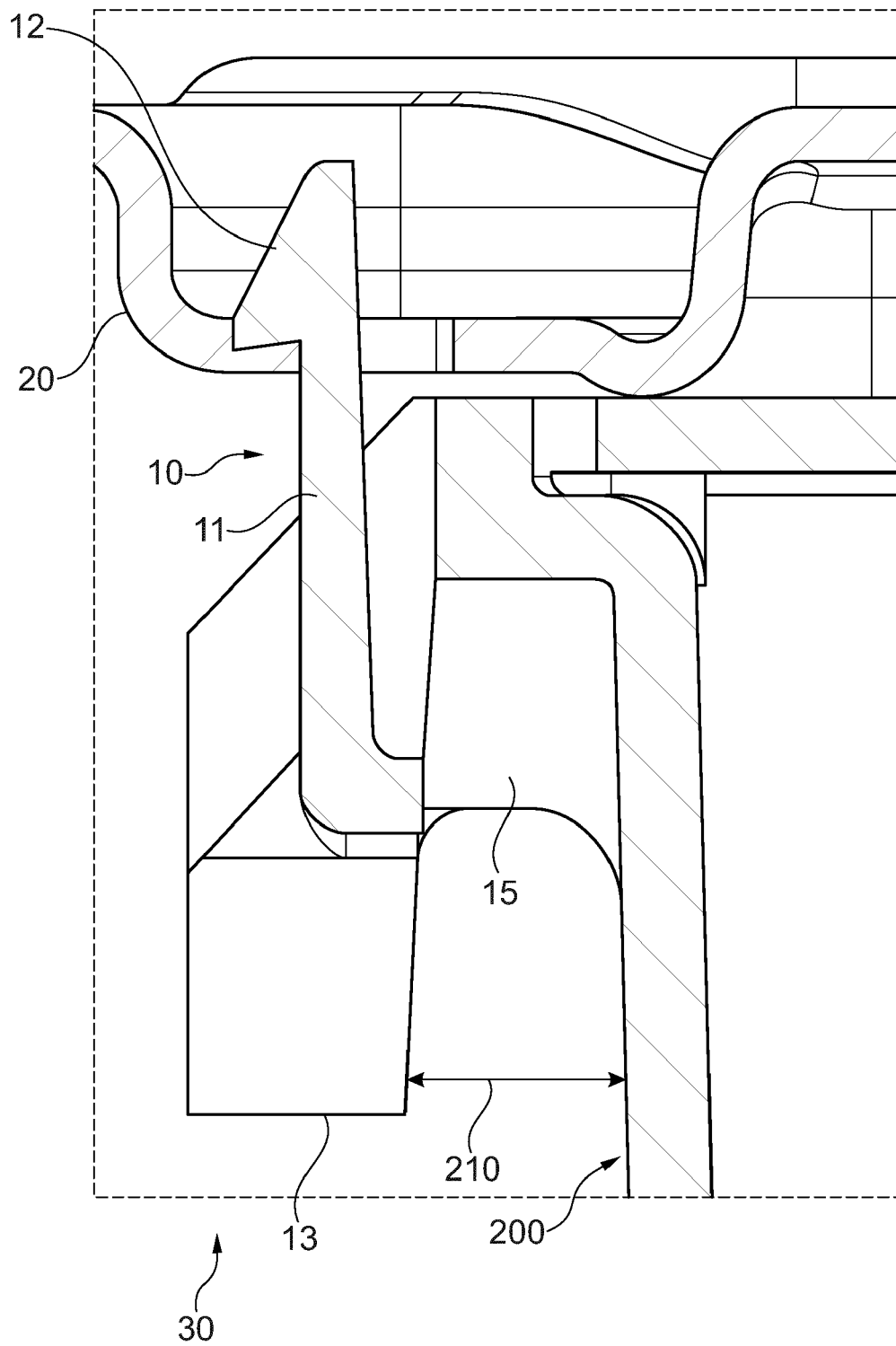


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 20 15 7051

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
			H01R H05K
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 15 May 2020	Examiner Mateo Segura, C
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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