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(54) **ADHESIVE DISPENSER**

(57) An adhesive dispenser (100) for applying adhesive on a substrate, comprising an inlet conduit (1a) configured for being coupled to at least one external cartridge in which an adhesive is stored, and distribution means (1) comprising a plurality of outlet openings configured for dispensing said adhesive. The distribution means (1) also comprise movable adjustment means (3) wherein at least part of said adjustment means (3) are arranged

in each outlet opening such that said adjustment means (3) demarcate an adjustable blocked area in each outlet opening. An outlet conduit having a variable section is formed in the area not covered by said blocked area in each outlet opening, adhesive beads having a different cross-section being able to be obtained by moving the adjustment means (3).

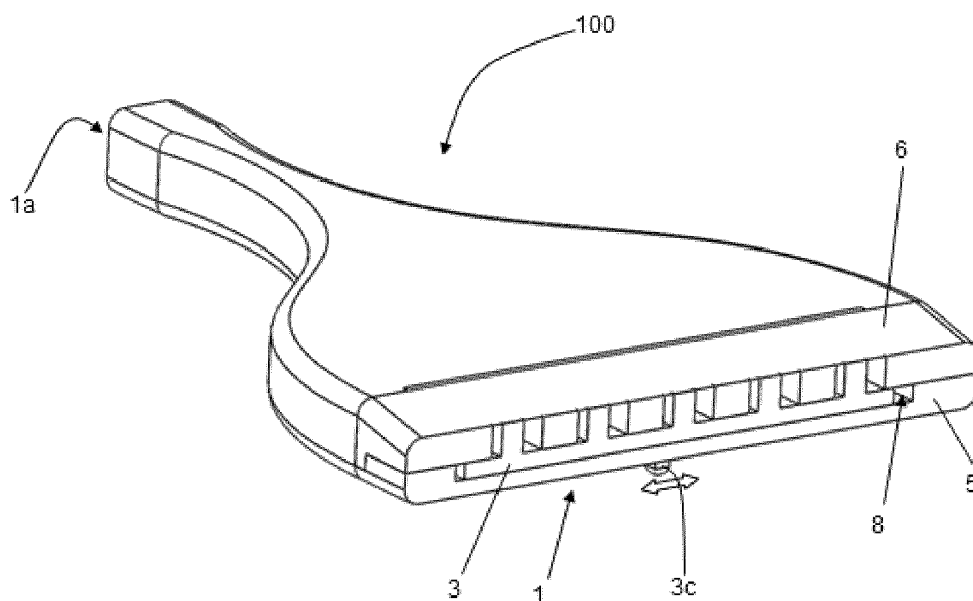


Fig. 1

Description

TECHNICAL FIELD

[0001] The present invention relates to adhesive dispensers.

PRIOR ART

[0002] Adhesive applicators capable of applying an adhesive on a substrate are known. The adhesive, usually a single-component adhesive, is stored in a cartridge of the applicator. Applying pressure on the adhesive pushes it, causing it to go through a dispenser, usually in the form of a nozzle, arranged at one end of the applicator.

[0003] Applicators can be manual applicators, usually being small in size, such as a dispenser gun, for example, in which the dispenser is arranged at one end.

[0004] There are also manual applicators for two-component adhesives in which the applicator comprises two cartridges, one for the adhesive and the other one for the catalyst. In this case, there is usually placed before the dispenser an intermediate mixing nozzle, such as the one described in EP1306123 A1, for example, in which the adhesive and catalyst are mixed.

[0005] Industrial applicators are larger than manual applicators and usually comprise one or more cartridges for storing the adhesive, which can also be a single-component or two-component adhesive. An intermediate mixing nozzle would also be used in the case of using two-component adhesive. In applicators of this type, the pressure required for pushing the adhesive can be applied in an automated manner. The dispenser can comprise several nozzles through which the adhesive is extracted.

[0006] In this sense, WO2014031980 A2 discloses an adhesive applicator comprising a dispenser with a plurality of outlet holes through which the adhesive to be applied on a substrate generally having a large surface, such as a roof cover, for example, is extracted. The dispenser described in WO2014031980 A2 comprises an inlet conduit configured for being coupled to a cartridge in which an adhesive is stored and the plurality of outlet holes.

DISCLOSURE OF THE INVENTION

[0007] The object of the invention is to provide an adhesive dispenser for applying adhesive on a substrate, as defined in the claims.

[0008] The adhesive dispenser of the invention comprises an inlet conduit which is configured for being coupled to at least one external cartridge in which an adhesive is stored, and distribution means comprising a plurality of outlet openings configured for dispensing said adhesive.

[0009] The distribution means also comprise movable adjustment means wherein at least part of said adjust-

ment means are arranged in each outlet opening such that said adjustment means demarcate an adjustable blocked area in each outlet opening. An outlet conduit having an adjustable section is formed in the area not covered by said blocked area in each outlet opening, adhesive beads having a different cross-section being able to be obtained by moving the adjustment means.

[0010] With the adhesive dispenser of the invention, the width of the adhesive beads can be changed in a quick and simple manner, which enables adapting to different needs depending on the type of substrate, on the type of load to which the parts to be attached will be subjected and/or on the type of adhesive used, thereby contributing to optimizing the distribution of adhesive beads, preventing wastage and therefore contributing to obtaining significant savings in adhesive.

[0011] Likewise, the adhesive dispenser of the invention enables an increased strength of the adhesive bonding with respect to a single hypothetical adhesive layer of the same width due to the contribution of the plane stress state that can be achieved in each adhesive bead by means of adjusting the width of the different adhesive beads, thereby contributing to obtaining an optimal relation of the performance- and-strength of the adhesive bonding. By using the adhesive dispenser of the invention, it is possible to change at least the width of the adhesive beads in a quick, simple and comfortable manner.

[0012] These and other advantages and features of the invention will become evident in view of the drawings and the detailed description of the invention.

DESCRIPTION OF THE DRAWINGS

[0013]

Figure 1 shows a perspective view of an adhesive dispenser according to an embodiment of the invention.

Figure 2 shows a first exploded perspective view of the adhesive dispenser of Figure 1.

Figure 3A shows a front view of the adhesive dispenser of Figure 1.

Figure 3B shows a front perspective view of the adhesive dispenser of Figure 1.

Figure 3C shows a front view of the upper casing of the adhesive dispenser of Figure 1.

Figure 3D shows a front view of the adjustment means of the adhesive dispenser of Figure 1.

Figure 4 shows a second exploded perspective view of the adhesive dispenser of Figure 1.

Figure 5 shows a perspective view of the application

of the adhesive dispenser of Figure 1 on a substrate.

Figure 5A shows a detail of the application of the adhesive dispenser of Figure 1 on the substrate.

DETAILED DISCLOSURE OF THE INVENTION

[0014] Figure 1 shows an adhesive dispenser 100 according to an embodiment of the invention which is suitable for applying adhesive on a substrate 13 shown in Figure 5.

[0015] The dispenser 100 of the invention comprises an inlet conduit 1a which is configured for being coupled to at least one external cartridge (not shown in the drawings) in which the adhesive to be applied is stored. The dispenser 100 also comprises distribution means 1 comprising a plurality of outlet openings 4 configured for dispensing said adhesive.

[0016] In the preferred embodiment of the invention, the inlet conduit 1a comprises connection means suitable for being coupled to the external cartridge directly or through an adhesive applicator comprising said external cartridge. Said connection means can comprise, for example, a thread or a quick coupling and fixing mechanism, such as a bayonet type mechanism, for example.

[0017] The distribution means 1 also comprise movable adjustment means 3 in which at least part of said adjustment means 3 are arranged in each outlet opening 4 such that said adjustment means 3 demarcate an adjustable blocked area 4b in each outlet opening 4, as seen in Figure 3A. An outlet conduit 4a having a variable section is formed in the area not covered by said blocked area 4b of each outlet opening 4, adhesive beads 2 having a different cross-section being able to be obtained by simply moving the adjustment means 3.

[0018] The dispenser 100 of the invention is of the type which can be coupled both to small-sized applicators, such as manual guns, for example, and to industrial applicators in which a dispenser 100 having larger dimensions could be used.

[0019] With the adhesive dispenser 100 of the invention, the width w of the adhesive beads 2 can be changed in a quick and simple manner, which enables adapting to different needs depending on the type of substrate 13, on the type of load to which the parts to be attached will be subjected and/or on the type of adhesive used, thereby contributing to optimizing the distribution of the adhesive beads 2, preventing wastage and therefore contributing to obtaining significant savings in adhesive.

[0020] Likewise, the adhesive dispenser 100 of the invention enables an increased strength of the adhesive bonding with respect to a single hypothetical adhesive layer of the same width due to the contribution of the plane stress state that can be achieved in each adhesive bead 2, for example by means of adjusting the width w of the different adhesive beads 2, thereby contributing to obtaining an optimal relation of the performance and strength of the adhesive bonding. By using the adhesive

dispenser 2 of the invention, it is possible to change the parameters of the adhesive beads 2 in a quick, simple and comfortable manner.

[0021] In the preferred embodiment of the invention, the adhesive used for attaching the substrate 13 to another component is a flexible adhesive, preferably a viscous fluid adhesive, which is ideal for being applied with most applicators on the market. Likewise, said adhesive can be a single-component or two-component adhesive.

[0022] In two-component adhesives, one of the components is the adhesive itself which will be stored in a cartridge (not shown in the drawings) and the other component is a catalyst which will be stored in another cartridge (not shown in the drawings). In adhesives of this type, the catalyst is used for curing the adhesive, i.e., so that the adhesive obtains the required properties before application.

[0023] An intermediate mixing unit (not shown in the drawings), such as the one described in EP1306123 A1, for example, is normally used with two-component adhesives, which would be arranged between the applicator and the dispenser 100 of the invention. The mixing of both components (adhesive and catalyst) takes place in said intermediate mixing unit, therefore the adhesive to be applied, i.e., the already mixed adhesive, reaches the inlet conduit 1a of the dispenser 100 of the invention.

[0024] In a variant of the invention not shown in the drawings, the mixing unit can be incorporated in the dispenser 100 of the invention, said mixing unit being able to be arranged between the inlet conduit 1a and the distribution means 1.

[0025] In the preferred embodiment of the invention, the adhesive to be applied is introduced through the inlet conduit 1a and conducted to an outlet channel 12, shown in Figure 2. The distribution means 1 are arranged after said outlet channel 12, downstream of same, such that the adhesive is metered through the distribution means 1 in the form of beads 2, as shown in Figure 5.

[0026] In the preferred embodiment of the invention, the adjustment means 3 are movable, said adjustment means 3 being able to be moved between a first position in which the width w of the adhesives beads 2 is maximum, and a second position in which the width w of the beads 2 is zero, the adjustment means 3 being able to be arranged in any intermediate position. In a variant of the invention, the distribution means 3 could be arranged such that in the second position the width w of the beads 2 is a minimum width w instead of zero.

[0027] The adjustment means 3 according to the preferred embodiment of the invention comprise a base 3a, a plurality of protuberances 3b which extend from said base 3a and are housed in a respective outlet opening 4, and a blocking wall 3b' arranged at the back of the adjustment means 3 adjacent to each of the protuberances 3b, each protuberance 3b and the corresponding blocking wall 3b' defining the blocked areas 4b of each outlet opening 4.

[0028] In the preferred embodiment of the invention,

the outlet openings 4 are configured in the form of longitudinal channels that are prolonged from the outlet channel 12 for distributing the adhesive arriving from the inlet conduit 1a. The protuberances 3b of the adjustment means 3 are, however, configured in the form of longitudinal bars, each bar being housed in a respective outlet opening 4. Said protuberances 3b are transversely movable together with the base 3a to which they are attached, as will be described in detail below. According to the preferred embodiment of the invention, the blocking walls 3b' are walls that are prolonged transversely to one side of the respective protuberance 3b, as seen in Figures 2 or 4.

[0029] Said blocking walls 3b', as well as protuberances 3b of the adjustment means, block the passage of the adhesive flowing from the outlet channel 12, forcing the adhesive to be extracted from the dispenser 100 through the outlet conduits 4a.

[0030] The adhesive dispenser 100 according to the preferred embodiment of the invention comprises a main casing 5 and a removable casing 6, as seen in Figures 2 or 4, which is fixed to the main casing 5. The adjustment means 3 are arranged between the main casing 5 and the removable casing 6, as seen in the drawings.

[0031] The removable casing 6 preferably comprises quick anchoring means 10 cooperating with receiving means 11 arranged in the main casing 5, which allows fixing both casings 5 and 6 to one another in a quick and simple manner. Said quick anchoring means 10 can be configured in the form of clamping, for example.

[0032] The fact that the removable casing 6 being separable allows, on one hand, assembling the adjustment means 3 in the dispenser 100 in a simple manner, and on the other hand, interchanging different removable casings 6 with outlet openings 4 of different dimensions and respective adjustment means 3, suitable for each type of removable casing 6, such that it is also possible to change the distance between the adhesive beads 2, which also enables adapting to the different needs in each case. For example, in those cases in which the parts to be attached will be or may be subjected to compression, it would be advisable to increase the separation between the beads 2 to assure that the side walls of two contiguous beads 2 do not come into contact with one another at any time. This thereby leads to the stress state of the adhesive being plane stress, since the beads 2 do not come into contact with one another, increasing adhesive efficacy.

[0033] In the preferred embodiment of the invention, the corresponding outlet openings 4 are arranged in the removable casing 6 as shown in Figures 2 or 4.

[0034] According to the preferred embodiment of the invention, the removable casing 6 comprises a plurality of separating walls 7 spaced from one another, as seen for example in Figure 2, an outlet opening 4 being defined between two contiguous separating walls 7. An outlet opening 4 is also defined at the ends of the removable casing 6 between a separating wall 7 and the wall of one

of the ends of the removable casing 6.

[0035] When the adjustment means 3 are in the first position, the protuberances 3b of said adjustment means 3 are in contact with a respective separating wall 7 and/or with the wall of one of the ends of the removable casing 6, such that the respective outlet conduits 4a are in the position with maximum opening, enabling the width w of the respective adhesive beads 2 to be maximum.

[0036] When the adjustment means 3 are in the second position, the protuberances 3b of said adjustment means 3 are in contact with the contiguous separating wall 7 and/or with the wall of the other end of the removable casing 6 such that the respective outlet conduits 4a are closed, i.e., in a position in which the width w of the respective adhesive beads 2 is zero. In a variant of the invention not shown in the drawings, the second position can correspond with a position in which the width w of the beads 2 is a minimum width w instead of zero, as already discussed above, in which case the travel of the adjustment means 3 would be limited to assure said minimum opening of the corresponding outlet conduits 4a.

[0037] In the preferred embodiment of the invention, when the adjustment means 3 are in the first position at least part of each blocking wall s' is arranged behind a respective separating wall 7, said at least part of the blocking wall s' extending as a continuation of the corresponding separating wall 7 as the adjustment means 3 are moved to the second position, thereby adjusting the width c of the corresponding outlet conduits 4a, and accordingly the width w of the adhesive beads 2.

[0038] In the preferred embodiment of the invention, the width s' of the blocking walls 3b' is equal to or less than the distance of separation s between contiguous outlet openings 4. Said width s' of each blocking wall 3b' is preferably equal to the width s of a corresponding separating wall 7.

[0039] According to the preferred embodiment of the invention, the main casing 5 comprises a housing 8, as seen in Figure 2, in which the adjustment means 3 are housed. Said housing 8 is configured to allow transverse movement of the adjustment means 3 therein. The side walls of said housing 8 and/or the separating walls 7 of the removable casing 6 could demarcate the maximum travel of the adjustment means 3.

[0040] Likewise, in a variant of the invention the side walls of said housing 8 can also be configured for limiting the travel of the adjustment means 3 in the second position, such that minimum opening of the outlet conduits 4a assuring a minimum width w of the adhesive beads 2 is assured.

[0041] In the preferred embodiment of the invention, the adjustment means 3 comprise an actuator 3c attached to the base 3a which can be actuated manually from the outside for moving said base 3a transversely inside the housing 8 of the main casing 5. Said actuator 3c is a shaft projecting from the main casing 5 going through a groove 9 arranged in said main casing 5, as can be seen in Figures 1, 3A, 3B or 5A, so that the user

can easily handle it. The width w of the adhesive beads 2 is therefore immediately and easily adjusted without having to complicate the construction of the adhesive dispenser 100 with complex constructive designs.

[0042] By adjusting the clearance between the main casing 5, the removable casing 6 and the adjustment means 3, it is not required to provide the dispenser 100 with additional mechanisms which allow fixing the adjustment means 3 in any intermediate position between the first and second positions described above. However, it is not ruled out that the dispenser 1 may comprise such mechanisms, such as the actuator 3c being able to comprise a thread to allow fixing the adjustment element 3 through a nut, for example.

[0043] The separation X between beads 2, as seen in Figure 3B or Figure 5A, is determined by the distance between two consecutive protuberances 3b of the adjustment means 3, or in other words by the sum of the width D of a corresponding outlet opening 4 and the width s of a respective separating wall 7, as seen in Figure 3C. Therefore, in the preferred embodiment of the invention said separation X between beads 2 is defined by the geometry of the removable casing 6. As already described above, it is possible to change the separation X between beads 2 easily by interchanging removable casings 6 with different geometries, i.e., with outlet openings 4 of different dimensions. Each removable casing 6 corresponds with respective adjustment means 3 which would also need to be adapted.

[0044] In the preferred embodiment of the invention, the width w of the adhesive beads 2 is defined by the variable width c of the outlet conduits 4a, which will be determined by the variable position of the adjusting elements 3.

[0045] When the adjustment means 3 are in the first position, the maximum width w of the adhesive beads 2 will be determined by the difference between the width D of the outlet openings 4 of the removable casing 6 and the width p of the respective protuberances 3b of the adjusting elements 3. Said maximum width w of the adhesive beads 2 will gradually decrease as the adjustment means 3 are moved to the second position, since the blocking wall 3b' will gradually extend as a continuation of the respective separating wall 7.

[0046] In any case, the width p of the protuberances 3b of the adjustment means 3 being smaller than the width D of the respective outlet openings 4 of the removable casing 6 must be complied with.

[0047] In the preferred embodiment of the invention, the height of the adhesive beads 2 is determined by the height H of the protuberances 3b of the adjustment means 3, as shown in Figure 3D. Since the removable casing 6 and the distribution means 3 are interchangeable, the dispenser 100 of the invention may be provided with different adjustment means 3 with protuberances 3b of different heights and a respective removable casing 6 suitable for each type of distribution means 3, such that it is also possible to easily change the height of the ad-

hesive beads 2.

[0048] The adhesive bonding obtained with the adhesive dispenser 100 according to the invention and applied on a substrate 13 therefore comprises a plurality of adhesive beads 2 in which it is possible to change the width w , the separation X of the beads 2, as well as the height of the adhesive beads 2 in a quick, simple and efficient manner to prevent the side walls of two contiguous beads 2 from coming into contact with one another when the parts to be attached are subjected to the corresponding workloads, since the working conditions of the parts to be attached can change from case to case, thereby changing the requirements of the adhesive 2 to be applied.

[0049] As is obvious throughout the description, the adhesive dispenser 100 of the invention enables an increased strength of the adhesive bonding with respect to a single hypothetical adhesive layer of the same width due to the contribution of the plane stress state that can be achieved in each adhesive bead 2 by means of adjusting the width w and the separation X between beads 2, for example, thereby contributing to obtaining an optimal relation of the performance and strength of the adhesive bonding. By using the adhesive dispenser 100 of the invention, it is possible to change at least the width w of the adhesive beads 2 and the separation X between beads 2 in a quick, simple and comfortable manner.

Claims

1. Adhesive dispenser for applying adhesive on a substrate (13), comprising an inlet conduit (1 a) configured for being coupled to at least one external cartridge in which an adhesive is stored, and distribution means (1) comprising a plurality of outlet openings (4) configured for dispensing said adhesive, **characterized in that** said distribution means (1) also comprise movable adjustment means (3), at least part of said adjustment means (3) being arranged in each outlet opening (4), the adjustment means (3) demarcating an adjustable blocked area (4b) in each outlet opening (4), an outlet conduit (4a) having a variable section being formed in the area not covered by said blocked area (4b) in each outlet opening (4), adhesive beads (2) having a different cross-section being able to be obtained by displacing the adjustment means (3).
2. Dispenser according to claim 1, wherein the adjustment means (3) are movable between a first position in which the width of the beads (2) is maximum and a second position in which the width (w) of the beads (2) is zero, the adjustment means (3) being able to be arranged in any intermediate position.
3. Dispenser according to claim 1 or 2, wherein the adjustment means (3) comprise a base (3a), a plurality

of protuberances (3b) which extend from the base (3a) and which are housed in a respective outlet opening (4), and a blocking wall (3b') arranged at the back of the adjustment means (3) adjacent to each of the protuberances (3b), each protuberance (3b) and the corresponding blocking wall (3b') defining the blocked areas (4b) of each outlet opening (4).

4. Dispenser according to claim 3, wherein the outlet openings (4) are longitudinal channels and the protuberances (3b) of the adjustment means (3) are longitudinal bars which are housed in said outlet openings (4) and transversely movable together with the base (3a) to which they are attached, the blocking walls (3b') being walls that are prolonged transversely to one side of the respective protuberance (3b). 5 10 15
5. Dispenser according to claim 4, wherein the width (s') of the blocking walls (3b') is equal to or less than the distance of separation (s) between contiguous outlet openings (4). 20
6. Dispenser according to claim 4 or 5, wherein the adjustment means (3) comprise an actuator (3c) attached to the base (3a), said actuator (3c) being able to be actuated manually from the outside for moving said base (3a) transversely. 25
7. Dispenser according to claim 6, comprising a main casing (5) and a removable casing (6) which is fixed to the main casing (5), the adjustment means (3) being arranged between the main casing (5) and the removable casing (6). 30
8. Dispenser according to claim 7, wherein the main casing (5) comprises a housing (8) for housing the adjustment means (3), said housing (8) being configured to allow transverse movement of the adjustment means (3) therein. 35 40
9. Dispenser according to claim 7 or 8, wherein the actuator (3c) of the distribution means (3) is a shaft projecting from the main casing (5) going through a groove (9) arranged in said main casing (5). 45
10. Dispenser according to any of claims 7 to 9, wherein the outlet openings (4) are arranged in the removable casing (6). 50
11. Dispenser according to claim 10, comprising a plurality of removable casings (6) with outlet openings (4) of different dimensions, and respective adjustment means (3) for each type of removable casing (6). 55
12. Dispenser according to any of claims 7 to 11, wherein the removable casing (6) comprises quick anchoring means (10) cooperating with receiving means (11)

arranged in the main casing (5) for fixing both casings (5, 6) to one another.

13. Dispenser according to any of the preceding claims, wherein the adhesive is a flexible adhesive, preferably a viscous fluid adhesive.
14. Dispenser according to claim 13, wherein said adhesive can be a single-component or two-component adhesive.

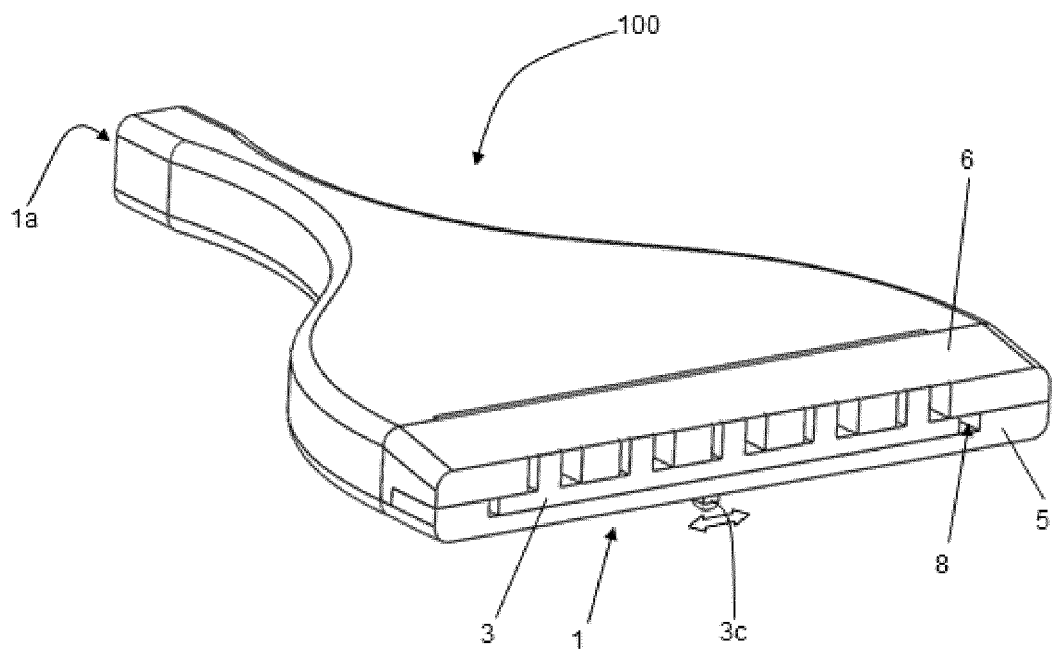


Fig. 1

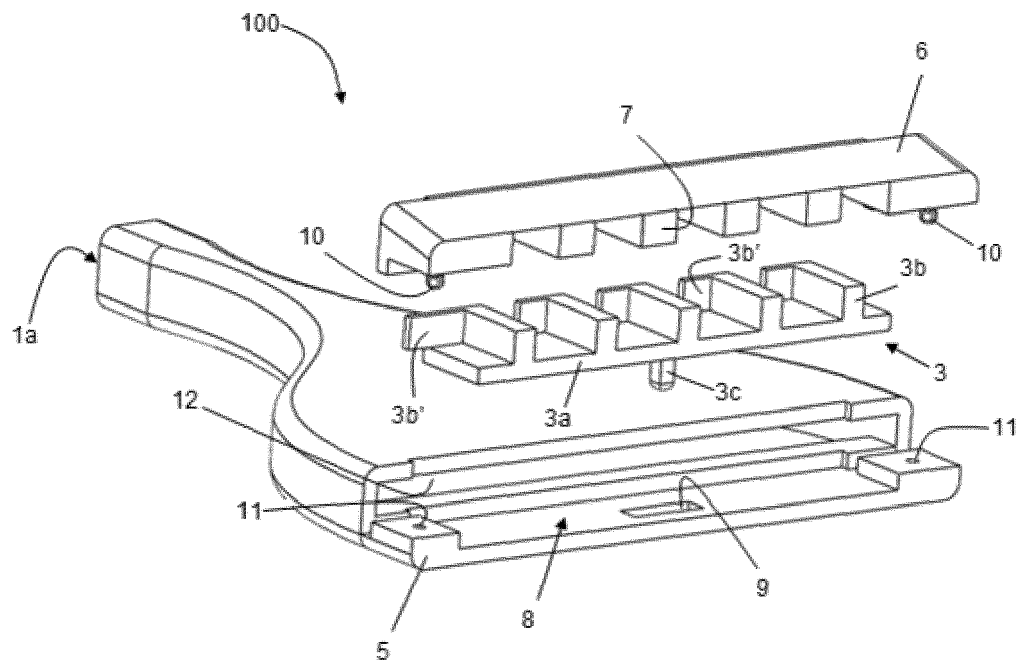


Fig. 2

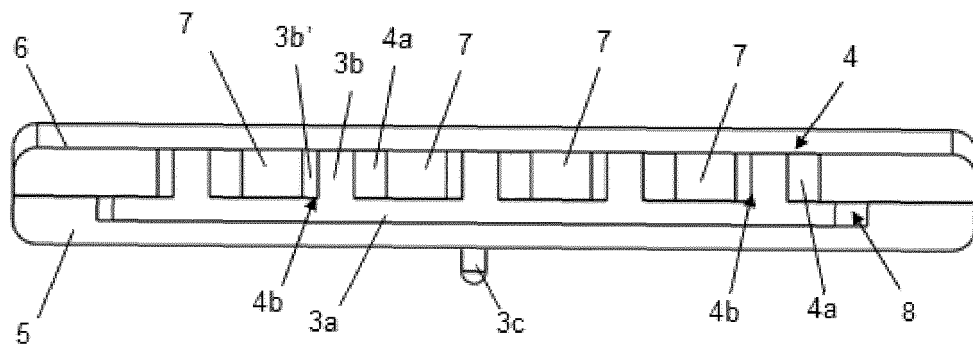


Fig. 3A

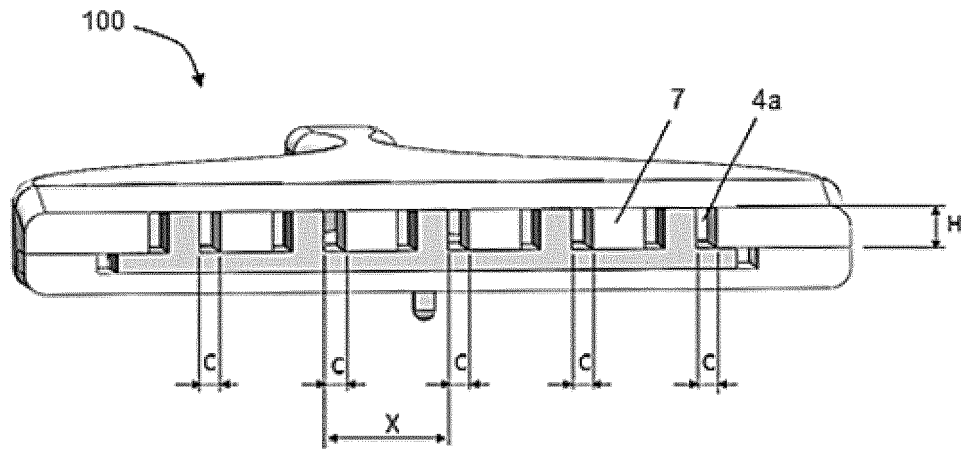


Fig. 3B

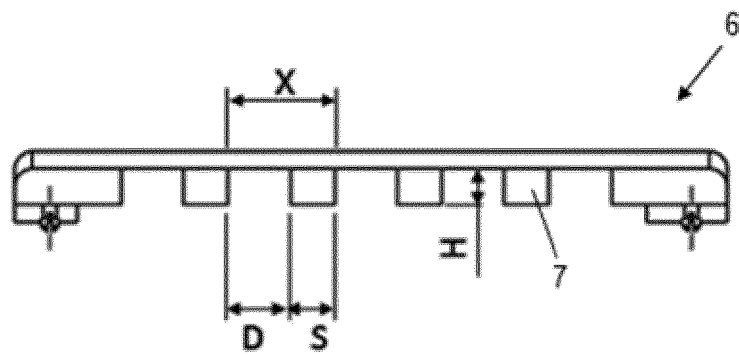


Fig. 3C

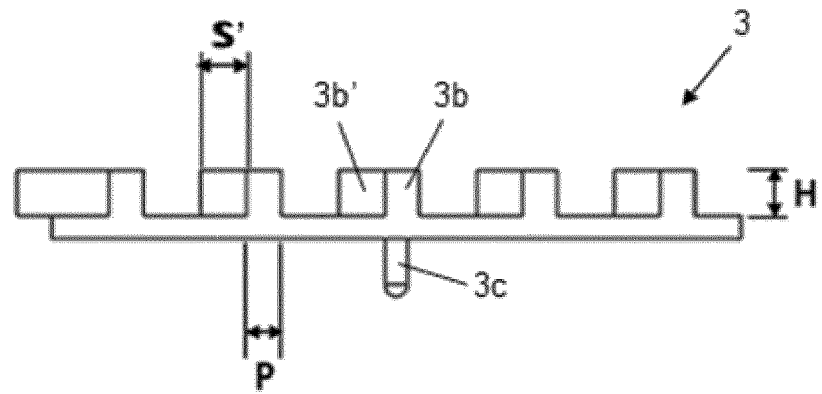


Fig. 3D

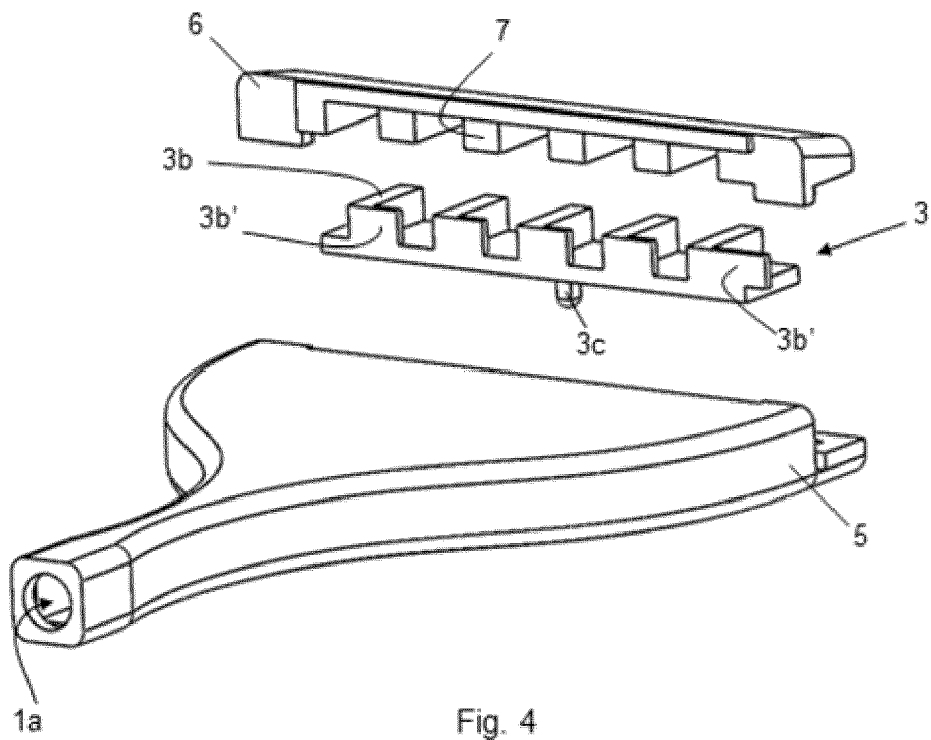


Fig. 4

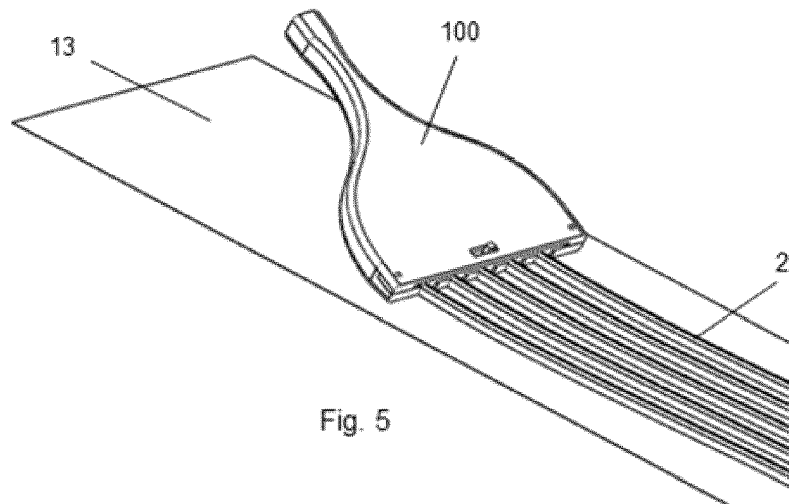


Fig. 5

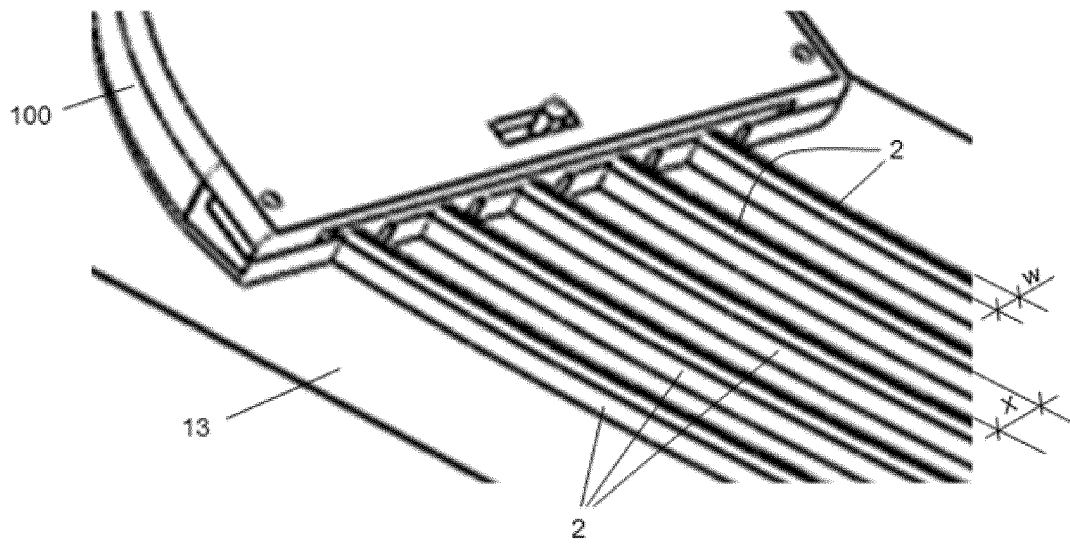


Fig. 5A



EUROPEAN SEARCH REPORT

Application Number
EP 16 38 2652

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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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A	* abstract *	3-12	
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	* abstract; figure 1 *		
	* paragraph [0054] *		

			TECHNICAL FIELDS SEARCHED (IPC)
			B05C B27G A47G E04F
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		15 May 2017	Ciotta, Fausto
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 16 38 2652

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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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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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