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(54) **ELECTRICAL CONNECTOR ASSEMBLY**

ELEKTRISCHE STECKVERBINDERANORDNUNG

ENSEMBLE DE CONNECTEUR ÉLECTRIQUE

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Description

I. Field of the invention

[0001] The present invention relates to an electrical connector assembly with a mate assist lever and an improved secondary locking device comprising a safety portion.

II. Technical background

[0002] In many fields of applications, in particular in the case of mass production assembly processes, it is important that electrical connectors can be connected easily and quickly, however, at the same time their mechanical and electrical connection has to fulfil high safety requirements. For example, in order to enable fast mating of connectors, in particular in the field of automotive applications where connectors housing pluralities of electrical contact terminals have to be mated, it is common that the connectors are provided with mate assist devices such as mate assist levers or sliders to facilitate mating. Such mate assist devices usually are provided movably or pivotably on a connector housing. Upon mating of the corresponding connector with a counter connector, the mate assist devices are moved from a first to a second position upon which movement the mating process is facilitated for example by means of a lever action.

[0003] To ensure the safe mating of such connectors, often the connectors are provided with secondary locking devices to lock the mate assist device in the second position whereby the mated state of the connectors is reinforced. Usually, to unmate the connectors, the secondary locking device first has to be released such that the mate assist device can be removed from the second position. Since such safety components have been subject to intensive development, often their large complexity results in connector components with complicated and often fragile parts.

[0004] Document WO 2007/098253 A2 describes an electrical connector assembly comprising a mate assist lever which serves to facilitate the mating of the connector assembly described therein with a corresponding counter connector. To enable a fast and easy mating of these two connectors, the mate assist lever is pivotably mounted to a connector housing of the connector assembly and can be moved from a first position to a second position during which movement it engages a part of the counter connector housing, thereby pulling the two connectors towards each other. When moved into the second position, a portion of the mate assist lever snaps behind a latch member of the connector housing to lock the mate assist lever in said second position. In order to release the mate assist lever, this latch member has to be manually accessed and moved by an operator. For additional safety, the connector assembly disclosed in WO 2006/101816 is further provided with a secondary locking device in form of a slider which can be moved between

a closed position and an open position on the connector housing. In the closed position, the secondary locking device is placed partially beneath the latch member, thereby blocking a movement of this member, such that the mate assist lever cannot be released unintentionally.

[0005] A further example of a connector assembly as disclosed in the preamble of the independent claim 1 with a mate assist lever is described in US 2006/0089031 A1. Similarly as in the case of the WO'253 described above, the mate assist lever disclosed in US'031 is provided pivotably on a connector housing of the assembly. The assembly is further provided with a secondary locking device for the mate assist lever which is mounted slidably to the mate assist lever itself. This secondary locking device can only be placed in the closed position when the mate assist lever is placed in the second position. To this end, the secondary locking device is provided with a pair of locking arms which are blocked by corresponding stop members of the mate assist lever as long as the mate assist lever is not placed in a second position.

[0006] Upon moving the mate assist lever into the second position, these locking arms are deflected by corresponding release members of the connector housing such that the secondary locking device is released and can be moved into a closed position where it locks the mate assist lever in the second position. Documents US 2006/211286 and US 2007/197071 disclose relevant prior art.

It is an object of the present invention to provide an electrical connector assembly with a mate assist lever and a secondary locking device which both are robust and of simple construction such that the electrical connector assembly is less susceptible to damage. It is a further object of the present invention to achieve these advantages with an inexpensive product, which can preferably be produced by injection molding.

[0007] These and other objects which become apparent upon reading the following description are solved by an electrical connector assembly according to claim 1.

III. Summary of the invention

[0008] According to the invention, an electrical connector assembly is provided which comprises a housing, a mate assist lever associated therewith and a secondary locking device for locking the mate assist lever. The connector housing can be formed as a single integral component but preferably comprises an upper and a lower half. In a preferred embodiment, the upper half is formed as a wire shroud and preferably the mate assist lever is pivotably mounted thereon. The mate assist lever serves to facilitate the mating of the electrical connector assembly with a corresponding counter connector and to secure the mating of these connectors. To this end, the mate assist lever can be moved between a first position and a second position, whereby upon moving from the first position to the second position, the mate assist lever pulls the connectors together. When the connectors are fully

mated and the mate assist lever is placed in the second position, the connectors cannot be unmated. When placed in this second position, the mate assist lever can be locked by the secondary locking device which for this purpose can be moved into a closed position. The secondary locking device thus provides an additional security mechanism to further secure the connectors in their mated state. To unmate the connectors, the secondary locking device first has to be moved into the open position, thereby releasing the mate assist lever to be movable into the first, respectively initial position. When the mate assist lever is placed again in this first position, the connectors can be unmated.

[0009] The electrical connector assembly further comprises at least one latch member which is assigned to the connector housing and which is provided with a stop surface adapted to engage a latching edge of the mate assist lever when the mate assist lever is placed in the second position. Due to this engagement of the stop surface and the latching edge, the latch member blocks the mate assist lever in the second position. To release the mate assist lever such that it is movable into the first position, the latch member first has to be accessed for example by an operator which manually acts on the latch member such that the stop surface and the latching edge are brought out of engagement. Preferably, the latch member is formed as a latch button which for releasing the mate assist lever has to be partially pressed into the connector housing by an operator.

[0010] To inhibit unintentional movement of the mate assist lever from the second position to the first position, the secondary locking device comprises a safety portion which is adapted to cover the latch member when the secondary locking device is placed in a closed position such that the latch member is no longer accessible. Thus, to prevent for example an operator to unintentionally release the mate assist lever to be movable from the second position to the first position, the secondary locking device preferably does not block a movement of the latch member but covers the latch member such that it is no longer accessible for example from the outside by an operator.

[0011] In a preferred embodiment, the latch member is movable between a latch position in which it is adapted to block a movement of the mate assist lever and a release position in which it is adapted to release the mate assist lever such that the mate assist lever is movable from the second position towards the first position. Preferably, upon moving the latch member towards the release position, a spring force acts against said movement, thereby urging the latch member in a direction towards the latch position. For example, in a preferred embodiment the latch member is integrally formed with the connector housing such that it is preferably provided with suitable elasticity to be movable between the latch position and the release position. This suitable elasticity can for example be provided by correctly choosing the housing material or the thickness of the housing material. Al-

ternatively, in a preferred embodiment the latch member can be formed as part of an elastic tongue which is cut out of the connector housing such that upon moving the latch member, the elastic tongue bends to cause said spring force.

[0012] In a preferred embodiment, the latching edge of the mate assist lever is adapted to engage the latch member upon movement of the mate assist lever from the first position to the second position such that upon said movement, the latch member is at least partially pressed towards the release position, preferably essentially into the connector housing, and snaps back into the latch position when the mate assist lever is fully placed in the second position. Thereby, preferably a snap fit interaction between the mate assist lever and the latch member can be achieved. In other words, when the mate assist lever is moved into the second position it first engages the latch member and presses the latch member towards the release position. Thereby, a spring force has to be overcome before the mate assist lever can snap behind the latch member into the second position. Preferably, when placed in the second position, the mate assist lever is urged backwards, i.e. towards the first position and thus is biased against the latch member which holds the mate assist lever in the second position. Thus, preferably, by simply partially pressing the latch member towards the release position, the mate assist lever becomes free and automatically moves in a direction towards the first position. The secondary locking device is devoid of any portion which is adapted to move beneath any portion of the latch member.

[0013] In a preferred embodiment when the secondary locking device is placed in the closed position, the secondary locking device is flush with the connector housing. Thus, no parts of the inventive secondary locking device - such as for example fragile locking arms - extend out of the outer boundaries of the connector housing. As a result, thereby a compact and robust form of the secondary locking device on the connector housing is achieved from which no parts can be broken off, e.g. during assembly. In addition, thereby an operator can visually and unambiguously distinguish the open position of the secondary locking device from the closed position of the secondary locking device. Further, preferably the secondary locking device can only be moved into the closed position when the mate assist lever is placed in the second position. As a result, preferably, the secondary locking device also provides the function of a CPA device (connector position assurance).

IV. Description of the preferred embodiments

[0014] In the following, the invention is described exemplarily with reference to the enclosed figures, in which:

Fig. 1 shows the inventive electrical connector assembly, whereby the mate assist lever is placed in the second position and the secondary lock-

ing device is placed in the open position;

Fig. 2 shows a detail of a different embodiment of a connector housing of the electrical connector assembly;

Fig. 3 shows the secondary locking device of the electrical connector assembly of fig. 1;

Fig. 4 shows the electrical connector assembly of fig. 1, whereby in this case the mate assist lever is placed in the first position and a first half of the connector housing and a second half of the connector housing are not connected; and

Fig. 5 illustrates the mating process of the electrical connector assembly of fig. 1 with a corresponding counter connector.

[0015] Fig. 1 shows an electrical connector assembly 100 with a mate assist lever 300 which is pivotably mounted to a first half 102 of a connector housing 101 and placed in a second position. As shown in this figure, the first connector housing 102 is formed as a wire shroud with an aperture 105 for the reception of corresponding cables or wires which first half is connected to a second housing half 104 which houses corresponding contact terminals (not visible due to the perspective). As can be taken from fig. 1, in the second position, the mate assist lever 300 is snapped behind a latch member 110 - which has the form of a latch button - such that a latching edge 301 of the mate assist lever 300 is blocked by a stop surface 111 of the latch member 110. To release the mate assist lever 300, the latch member 110 has to be accessed for example by an operator such that it is moved from a latch position as shown in fig. 1 towards a release position, i.e. in the shown case partially into the connector housing 101. As can be taken from fig. 1, the electrical connector assembly 100 is further provided with a secondary locking device 200, which in the shown case is placed in an open position. As may be derived from fig. 1, the secondary locking device 200 can be moved to the right in the figure, i.e. towards the closed position in which a safety portion 201 of the secondary locking device 200 covers the latch member 110. In this case, when the safety portion 201 covers the latch member 110, the latch member 110 is no longer accessible from the outside, i.e. an operator can no longer press the shown latch button to release the mate assist lever. As may be derived further from fig. 1, for this purpose, the safety portion 201 is provided with a receiving channel 211, the entrance of which is indicated by reference numeral 211. This receiving channel 211 is adapted to receive the latch member 110 such that the latch member 110 is fully covered when the secondary locking device 200 is placed in the closed position.

[0016] As may be taken from fig. 1, the secondary locking device 200 is provided with at least one stop edge

203 which is flush with the stop surface 111 of the latch member 110 when the secondary locking device 200 is placed in the closed position. Thereby, the secondary locking device 200 itself supports the latch member to block the mate assist lever 300 in the second position. In addition when placed in the closed position, preferably the secondary locking device 200 is received in between rails 115 of the connector housing 101 which are shaped correspondingly to the shape of the secondary locking device 200. Thus, when placed in the closed position, the secondary locking device is flush with the connector housing 101 such that no parts of the secondary locking device 200 extend outwards of the outer boundaries of the connector housing 101, thereby reducing the susceptibility of the secondary locking device 200 to damage for example upon assembly processes.

[0017] Fig. 2 shows a detail of a connector housing 101' of a different embodiment of the electrical connector assembly 100. As can be seen in this figure, preferably the latch member 110' is formed as part of an elastic tongue 113' which is cut out of the connector housing and as can be taken from the figure, upon moving the latch member preferably from the latch position towards its release position, i.e. essentially into the connector housing 101', the latch member 110' bends and causes a spring force which urges the latch member 110' backwards towards the latch position, i.e. in a direction out of the connector housing 101'.

[0018] Fig. 3 shows a side view of the secondary locking device 200 of the electrical connector assembly 100 of fig. 1. As can be taken from this side view, the secondary locking device 200 is provided with fixing latches 225 which are designed to attach the secondary locking device 200 slidably to the connector housing 101. Further, preferably the secondary locking device 200 is provided with at least one holding arm 220 which protrudes from the secondary locking device 200 essentially in a direction of movement when the secondary locking device 200 is moved from the open position to the closed position. Preferably, as can be taken from the figure, the holding arm 220 comprises a stop projection 221 which is adapted to engage a corresponding block face (not visible in the figure) of the connector housing 101 to prevent a movement of the secondary locking device 200 into the closed position. Further, the holding arm preferably is provided with a release projection 223 which is adapted to be engaged by a corresponding release member 305 of the mate assist lever 300 to be pressed essentially into the connector housing 101, thereby deflecting the holding arm 220 to release the stop projection 221 and enable a movement of the secondary locking device 200 into the closed position.

[0019] This interaction may be derived more easily from fig. 4. Fig. 4 shows the secondary locking device 200 placed in the open position and in this figure release projections 223 are visible being placed inside of guiding channels 121. As it will be clear to the person skilled in the art, said stop projections 221 are not visible due to

the perspective of the figure, but are similarly placed inside of guiding channels 121 being engaged with said block faces (not visible due to the figure perspective) of the upper housing half 102. Thus, when the secondary locking device 200 is placed in the open position, due to the engagement between the stop projection 221 with corresponding block faces of the connector housing 101, a movement of the secondary locking device 200 into the closed position is prevented. As can be derived further from fig. 4, when the mate assist lever 300 is moved into the second position, release members 305 engage the release projections 223 and press the same essentially into the connector housing, thereby deflecting the holding arm downwards whereby the stop projections 221 are released from the block faces. Thereby, the secondary locking device 200 is released and can be moved

[0020] Thereby, the secondary locking device 200 is released and can be moved into the closed position. In addition, preferably due to a spring force which acts against the deflection of the folding arm, the release projections are urged backwards, pressing against the release members 305 of the mate assist lever 300, whereby the mate assist lever 300 is urged towards the first position and is biased against the latch member 110.

[0021] Fig. 5 illustrates the mating process of the electrical connector assembly with a corresponding counter connector 400. As shown in part 1 of fig. 5, first the electrical connector assembly 100 is moved downwards along arrow 601 onto the counter connector whereby cam pins 401 of the counter connector are moved into corresponding cam channels 303 to be inserted into cam grooves of the mate assist lever 300. As illustrated in part 2, in a next step the mate assist lever is moved from the first position to the second position along arrow 603. As it is clear to the person skilled in the art, thereby the cam grooves are moved along the cam pins 401 such that the connector assembly and the counter connector are pulled together. In a following step as indicated by arrow 605 in part 3, the secondary locking device 200 is moved from its open position to its closed position as shown in part 4 in which it secures and blocks the mate assist lever 300 in the second position.

Claims

1. Electrical connector assembly (100) comprising a connector housing (101), a mate assist lever (300) associated therewith and a secondary locking device (200) for locking the mate assist lever, whereby the mate assist lever (300) is movable between a first position and a second position, and the secondary locking device (200) is movable between an open position and a closed position, the electrical connector assembly (100) further comprising at least one latch member (110) which is assigned to the connector housing (101) and which is provided with a stop surface (111) adapted to engage a latching

edge (301) of the mate assist lever (300) when the mate assist lever (300) is placed in the second position to thereby block the mate assist lever (300) in the second position

characterized in that

the secondary locking device (200) is provided with at least one stop edge (203) which is flush with a stop surface (111) of the latch member (110) when the secondary locking device (200) is placed in the closed position ;the secondary locking device (200) comprises a safety portion (201) provided with a receiving channel (211) for receiving the latch member (110) to fully cover the latch member (110) when the secondary locking device is placed in the closed position such that the latch member (110) is no longer accessible.

2. Electrical connector assembly (100) according to claim 1, **characterized in that** the latch member (110) is movable between a latch position in which it is adapted to block a movement of the mate assist lever (300) wherein a latching edge (301) of the mate assist lever (300) is blocked by a stop surface (111) of the latch member (110) and a release position in which it is adapted to release the mate assist lever (300) such that the mate assist lever (300) is movable from the second position towards the first position.
3. Electrical connector assembly (100) according to any one of the preceding claims, **characterized in that** the latch member (110) is formed integrally with the connector housing (101) such that it is provided with suitable elasticity to be movable between the latch position and the release position.
4. Electrical connector assembly (100) according to any one of the preceding claims, **characterized in that** the latch member (110') is formed as part of an elastic tongue (113') which is cut out of the connector housing, and upon moving the latch member (110'), preferably towards its release position, bends to cause a spring force.
5. Electrical connector assembly (100) according to claim 2, **characterized in that** the latching edge (301) of the mate assist lever (300) is adapted to engage the latch member (110) upon movement of the mate assist lever (300) from the first position to the second position, such that upon said movement the latch member (110) is at least partially pressed towards the release position, preferably essentially into the connector housing (101), and snaps back into the latch position when the mate assist lever (300) is fully placed in the second position.
6. Electrical connector assembly (100) according to any one of the preceding claims, **characterized in that** the secondary locking device (200) is devoid of

any portion which is adapted to move beneath any portion of the latch member (110).

7. Electrical connector assembly (100) according to any one of the preceding claims, **characterized in that** when the secondary locking device (200) is placed in the closed position, the secondary locking device (200) is flush with the connector housing (101), and when placed in the closed position, the secondary locking device (200) is received in between rails (115) of the connector housing (101) which are shaped corresponding to the shape of the secondary locking device (200). 5
8. Electrical connector assembly (100) according to any one of the preceding claims, **characterized in that** the secondary locking device (200) can only be moved into the closed position when the mate assist lever (300) is placed in the second position. 10
9. Electrical connector assembly (100) according to any one of the preceding claims, **characterized in that** the secondary locking device (200) is provided with at least one holding arm (220) protruding from the secondary locking device (200) essentially in a direction of movement when the secondary locking device (200) is moved from the open position to the closed position, whereby the holding arm (220) comprises a stop projection (221) which is adapted to engage a corresponding block face of the connector housing (101) to prevent a movement of the secondary locking device (200) into the closed position. 15
10. Electrical connector assembly (100) according to the preceding claim, **characterized in that** the holding arm (220) is provided with a release projection (223) which is adapted to be engaged by a corresponding release member (305) of the mate assist lever (300) to be pressed essentially into the connector housing (101), thereby deflecting the holding arm (220) to release the stop projection (221) and enable a movement of the secondary locking device (200) into the closed position. 20
11. Electrical connector assembly (100) according to the preceding claim, **characterized in that** when the secondary locking device (200) is placed in the closed position and the mate assist lever (300) is placed in the second position, the release member (305) of the mate assist lever (300) engages a part of the holding arm (220), preferably the release projection (223), such that the holding (220) arm is deflected and thus biased against the release member (305), thereby causing the mate assist lever (300) to be urged towards the first position. 25

Patentansprüche

1. Elektrische Verbinderanordnung (100), die ein Verbindergehäuse (101), einen damit assoziierten Zusammenfügen-Unterstützungshebel (300) und eine sekundäre Verriegelungsvorrichtung (200) zum Verriegeln des Zusammenfügen-Unterstützungshebels aufweist, wobei der Zusammenfügen-Unterstützungshebel (300) zwischen einer ersten Position und einer zweiten Position bewegbar ist, und die sekundäre Verriegelungsvorrichtung (200) zwischen einer offenen Position und einer geschlossenen Position bewegbar ist, wobei die elektrische Verbinderanordnung (100) weiter zumindest ein Schnappverriegelungselement (110) aufweist, das dem Verbindergehäuse (101) zugeordnet ist und das mit einer Anschlagfläche (111) vorgesehen ist, die ausgebildet ist, mit einer Verriegelungskante (301) des Zusammenfügen-Unterstützungshebels (300) in Eingriff zu sein, wenn der Zusammenfügen-Unterstützungshebel (300) in der zweiten Position positioniert ist, um dadurch den Zusammenfügen-Unterstützungshebel (300) in der zweiten Position zu blockieren, **dadurch gekennzeichnet, dass** die sekundäre Verriegelungsvorrichtung (200) mit zumindest einer Anschlagkante (203) vorgesehen ist, die bündig ist mit einer Anschlagfläche (111) des Schnappverriegelungselements (110), wenn die sekundäre Verriegelungsvorrichtung (200) in der geschlossenen Position positioniert ist; wobei die sekundäre Verriegelungsvorrichtung (200) einen Sicherheitsteil (201) aufweist, der mit einem Aufnahmekanal (211) vorgesehen ist zum Aufnehmen des Schnappverriegelungselements (110), um das Schnappverriegelungselement (110) vollständig abzudecken, wenn die sekundäre Verriegelungsvorrichtung in der geschlossenen Position positioniert ist, derart, dass das Schnappverriegelungselement (110) nicht mehr zugänglich ist. 30
2. Elektrische Verbinderanordnung (100) gemäß Anspruch 1, **dadurch gekennzeichnet, dass** das Schnappverriegelungselement (110) zwischen einer Verriegelungsposition, in der es ausgebildet ist, eine Bewegung des Zusammenfügen-Unterstützungshebels (300) zu blockieren, wobei eine Verriegelungskante (301) des Zusammenfügen-Unterstützungshebels (300) durch eine Anschlagfläche (111) des Schnappverriegelungselements (110) blockiert ist, und einer Freigabeposition bewegbar ist, in der es ausgebildet ist, den Zusammenfügen-Unterstützungshebel (300) freizugeben derart, dass der Zusammenfügen-Unterstützungshebel (300) von der zweiten Position in die erste Position bewegbar ist. 35
3. Elektrische Verbinderanordnung (100) gemäß einem der vorhergehenden Ansprüche, **dadurch ge-** 40

- kennzeichnet, dass** das Schnappverriegelungselement (110) integral mit dem Verbindergehäuse (101) gebildet ist derart, dass es mit geeigneter Elastizität vorgesehen ist, um zwischen der Verriegelungsposition und der Freigabeposition bewegbar zu sein.
4. Elektrische Verbinderanordnung (100) gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Schnappverriegelungselement (110') als Teil einer elastischen Zunge (113') gebildet ist, die aus dem Verbindergehäuse geschnitten ist, und sich bei einem Bewegen des Schnappverriegelungselements (110') vorzugsweise in Richtung seiner Freigabeposition biegt, um eine Federkraft zu verursachen.
5. Elektrische Verbinderanordnung (100) gemäß Anspruch 2, **dadurch gekennzeichnet, dass** die Verriegelungskante (301) des Zusammenfügen-Unterstützungshebels (300) ausgebildet ist, das Schnappverriegelungselement (110) bei einer Bewegung des Zusammenfügen-Unterstützungshebels (300) von der ersten Position in die zweite Position zu kontaktieren derart, dass bei der Bewegung das Schnappverriegelungselement (110) zumindest teilweise in Richtung der Freigabeposition gedrückt wird, vorzugsweise im Wesentlichen in das Verbindergehäuse (101), und zurück in die Verriegelungsposition schnappt, wenn der Zusammenfügen-Unterstützungshebel (300) vollständig in der zweiten Position positioniert ist.
6. Elektrische Verbinderanordnung (100) gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die sekundäre Verriegelungsvorrichtung (200) frei von jedem Teil ist, das ausgebildet ist, unter einen Teil des Schnappverriegelungselements (110) bewegt zu werden.
7. Elektrische Verbinderanordnung (100) gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass**, wenn die sekundäre Verriegelungsvorrichtung (200) in der geschlossenen Position positioniert ist, die sekundäre Verriegelungsvorrichtung (200) bündig ist mit dem Verbindergehäuse (101), und, wenn in der geschlossenen Position positioniert, die sekundäre Verriegelungsvorrichtung (200) zwischen Schienen (115) des Verbindergehäuses (101) aufgenommen ist, die entsprechend der Form der sekundären Verriegelungsvorrichtung (200) geformt sind.
8. Elektrische Verbinderanordnung (100) gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die sekundäre Verriegelungsvorrichtung (200) nur in die geschlossene Position bewegt werden kann, wenn der Zusammenfügen-Unterstützungshebel (300) in der zweiten Position positioniert ist.
9. Elektrische Verbinderanordnung (100) gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die sekundäre Verriegelungsvorrichtung (200) mit zumindest einem Haltearm (220) vorgesehen ist, der von der sekundären Verriegelungsvorrichtung (200) im Wesentlichen in einer Bewegungsrichtung vorsteht, wenn die sekundäre Verriegelungsvorrichtung (200) von der offenen Position in die geschlossene Position bewegt wird, wobei der Haltearm (220) einen Anschlagvorsprung (221) aufweist, der ausgebildet ist zum Kontaktieren einer entsprechenden Blockierfläche des Verbindergehäuses (101), um eine Bewegung der sekundären Verriegelungsvorrichtung (200) in die geschlossene Position zu verhindern.
10. Elektrische Verbinderanordnung (100) gemäß dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** der Haltearm (220) mit einem Freigabevorsprung (223) vorgesehen ist, der ausgebildet ist, durch ein entsprechendes Freigabeelement (305) des Zusammenfügen-Unterstützungshebels (300) in Eingriff zu sein, um im Wesentlichen in das Verbindergehäuse (101) gedrückt zu werden, wodurch der Haltearm (220) abgelenkt wird, um den Anschlagvorsprung (221) freizugeben und eine Bewegung der sekundären Verriegelungsvorrichtung (200) in die geschlossene Position zu ermöglichen.
11. Elektrische Verbinderanordnung (100) gemäß dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass**, wenn die sekundäre Verriegelungsvorrichtung (200) in der geschlossenen Position positioniert ist und der Zusammenfügen-Unterstützungshebel (300) in der zweiten Position positioniert ist, das Freigabeelement (305) des Zusammenfügen-Unterstützungshebels (300) einen Teil des Haltearms (220), vorzugsweise den Freigabevorsprung (223), derart kontaktiert, dass der Haltearm (220) abgelenkt wird und somit gegen das Freigabeelement (305) beeinflusst wird, wodurch der Zusammenfügen-Unterstützungshebel (300) in Richtung der ersten Position gedrückt wird.

Revendications

1. Ensemble formant connecteur électrique (100) comprenant un boîtier de connecteur (101), un levier d'assistance d'accouplement (300) associé avec ce boîtier et un dispositif de blocage secondaire (200) pour bloquer le levier d'assistance d'accouplement, grâce à quoi le levier d'assistance d'accouplement (300) est déplaçable entre une première position et une seconde position, et le dispositif de blocage se-

conculaire (200) est déplaçable entre une position ouverte et une position fermée, l'ensemble formant connecteur électrique (100) comprenant en outre au moins un élément de verrou (110) qui est attribué au boîtier de connecteur (101) et qui est doté d'une surface d'arrêt (111) adaptée à engager une bordure de verrouillage (301) du levier d'assistance d'accouplement (300) quand le levier d'assistance d'accouplement (300) est placé dans la seconde position pour bloquer ainsi le levier d'assistance d'accouplement (300) dans la seconde position **caractérisé en ce que**

le dispositif de blocage secondaire (200) est doté d'au moins une bordure d'arrêt (203) qui est en affleurement avec une surface d'arrêt (111) de l'élément de verrou (110) quand le dispositif de blocage secondaire (200) est placé dans la position fermée ; le dispositif de blocage secondaire (200) comprend une portion de sécurité (201) dotée d'un canal de réception (211) pour recevoir l'élément de verrou (110) afin de couvrir entièrement l'élément de verrou (110) quand le dispositif de blocage secondaire est placé dans la position fermée, de sorte que l'élément de verrou (110) n'est plus accessible.

2. Ensemble formant connecteur électrique (100) selon la revendication 1,

caractérisé en ce que l'élément de verrou (110) est déplaçable entre une position verrouillée dans laquelle il est adapté à bloquer un mouvement du levier d'assistance d'accouplement (300) de sorte qu'une bordure de verrouillage (301) du levier d'assistance d'accouplement (300) est bloquée par une surface d'arrêt (111) de l'élément de verrou (110) et une position relâchée dans laquelle il est adapté à relâcher le levier d'assistance d'accouplement (300), de sorte que le levier d'assistance d'accouplement (300) est déplaçable depuis la seconde position vers la première position.

3. Ensemble formant connecteur électrique (100) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'élément de verrou (110) est formé intégralement avec le boîtier de connecteur (101) de telle façon qu'il est doté d'une élasticité appropriée pour être déplaçable entre la position verrouillée et la position relâchée.

4. Ensemble formant connecteur électrique (100) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'élément de verrou (110') est formé comme une partie d'une languette élastique (113') qui est découpée hors du boîtier de connecteur et qui, lors du déplacement de l'élément de verrou (110'), de préférence vers sa position de relâchement, se cintre pour provoquer une force élastique.

5. Ensemble formant connecteur électrique (100) selon la revendication 2, **caractérisé en ce que** la bordure de verrouillage (300) du levier d'assistance d'accouplement (300) est adaptée à engager l'élément de verrou (110) lors d'un mouvement du levier d'assistance d'accouplement (300) depuis la première position vers la seconde position, de sorte que lors dudit mouvement l'élément de verrou (110) est au moins partiellement pressé vers la position relâchée, de préférence essentiellement à l'intérieur du boîtier de connecteur (101), et saute en retour dans la position verrouillée quand le levier d'assistance d'accouplement (300) est entièrement placé dans la seconde position.

6. Ensemble formant connecteur électrique (100) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le dispositif de blocage secondaire (200) est dépourvu d'une portion quelconque qui serait adaptée à se déplacer au-dessous d'une portion quelconque de l'élément de verrou (110).

7. Ensemble formant connecteur électrique (100) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** lorsque le dispositif de blocage secondaire (200) est placé dans la position fermée, le dispositif de blocage secondaire (200) est en affleurement avec le boîtier de connecteur (101), et lorsqu'il est placé dans la position fermée, le dispositif de blocage secondaire (200) est reçu entre des rails (115) du boîtier de connecteur (101) qui sont conformés en correspondance à la forme du dispositif de blocage secondaire (200).

8. Ensemble formant connecteur électrique (100) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le dispositif de blocage secondaire (200) peut uniquement être déplacé jusque dans la position fermée quand le levier d'assistance d'accouplement (300) est placé dans la seconde position.

9. Ensemble formant connecteur électrique (100) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le dispositif de blocage secondaire (200) est doté d'au moins un bras de maintien (220) qui se projette depuis le dispositif de blocage secondaire (200) essentiellement dans une direction de mouvement quand le dispositif de blocage secondaire (200) est déplacé depuis la position ouverte jusqu'à la position fermée, dans lequel le bras de maintien (220) comprend une projection d'arrêt (221) qui est adaptée à engager une face de blocage correspondante du boîtier de connecteur (101) pour empêcher un mouvement du dispositif de blocage secondaire (200) jusque dans la position fermée.

10. Ensemble formant connecteur électrique (100) selon la revendication précédente, **caractérisé en ce que** le bras de maintien (220) est doté d'une projection de relâchement (223) qui est adaptée à être engagée par un élément de relâchement correspondant (305) du levier d'assistance d'accouplement (300) afin d'être pressé essentiellement dans le boîtier de connecteur (101), en défléchissant ainsi le bras de maintien (220) pour relâcher la projection d'arrêt (221) et permettre un mouvement du dispositif de blocage secondaire (200) jusque dans la position fermée. 5 10
11. Ensemble formant connecteur électrique (100) selon la revendication précédente, **caractérisé en ce que**, lorsque le dispositif de blocage secondaire (200) est placé dans la position fermée et le levier d'assistance d'accouplement (300) est placé dans la seconde position, l'élément de relâchement (305) du levier d'assistance d'accouplement (300) engage une partie du bras de maintien (220), de préférence la projection de relâchement (223), de telle façon que le bras de maintien (220) est défléchi et donc forcé contre l'élément de relâchement (305), en amenant ainsi le levier d'assistance d'accouplement (300) à être repoussé vers la première position. 15 20 25

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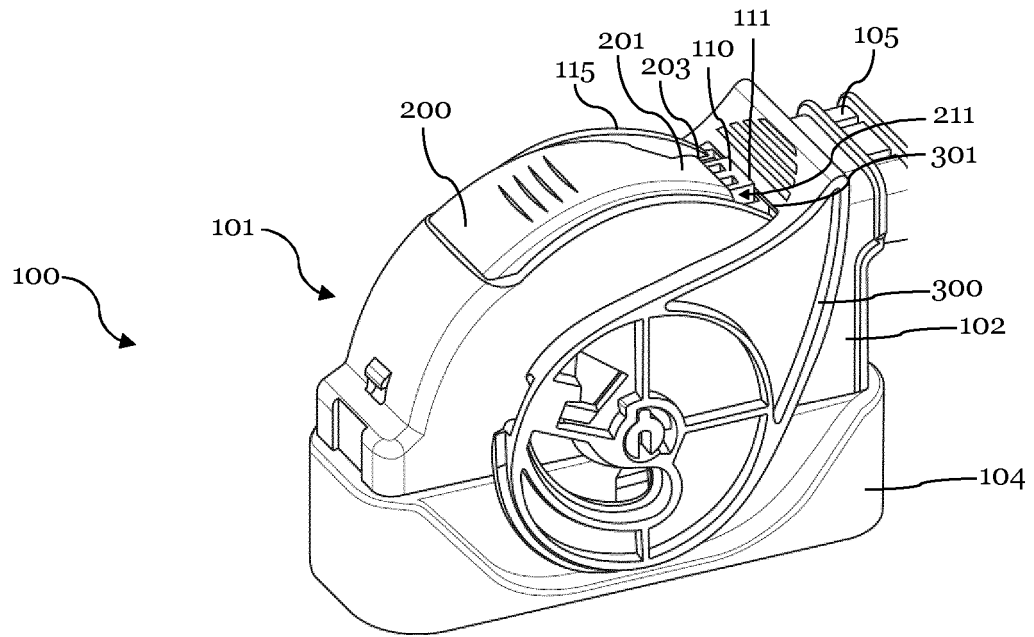


Fig. 1

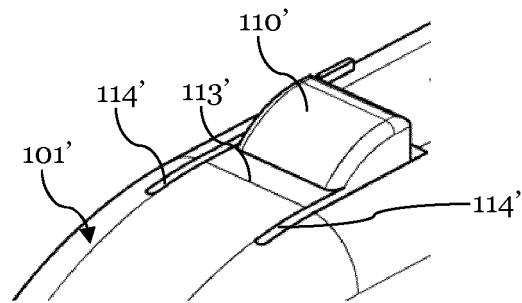


Fig. 2

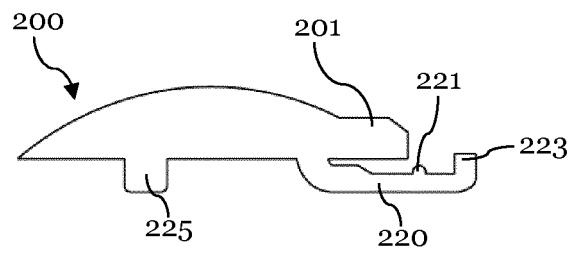


Fig. 3

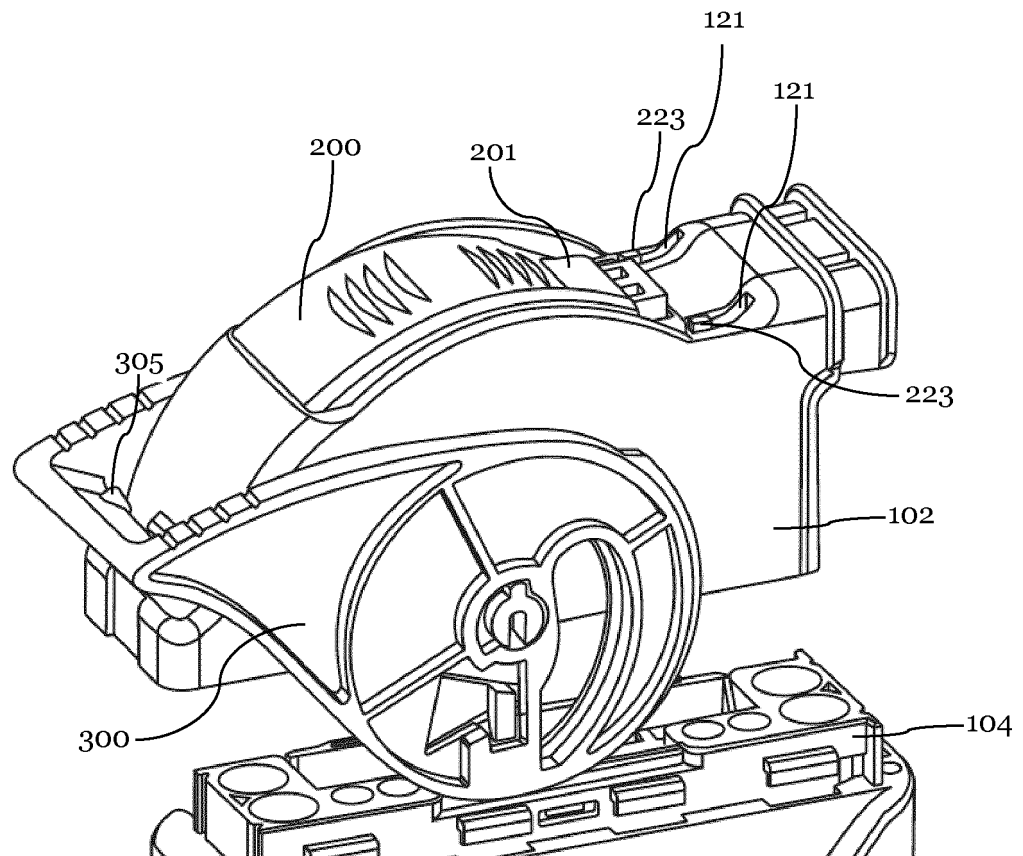


Fig. 4

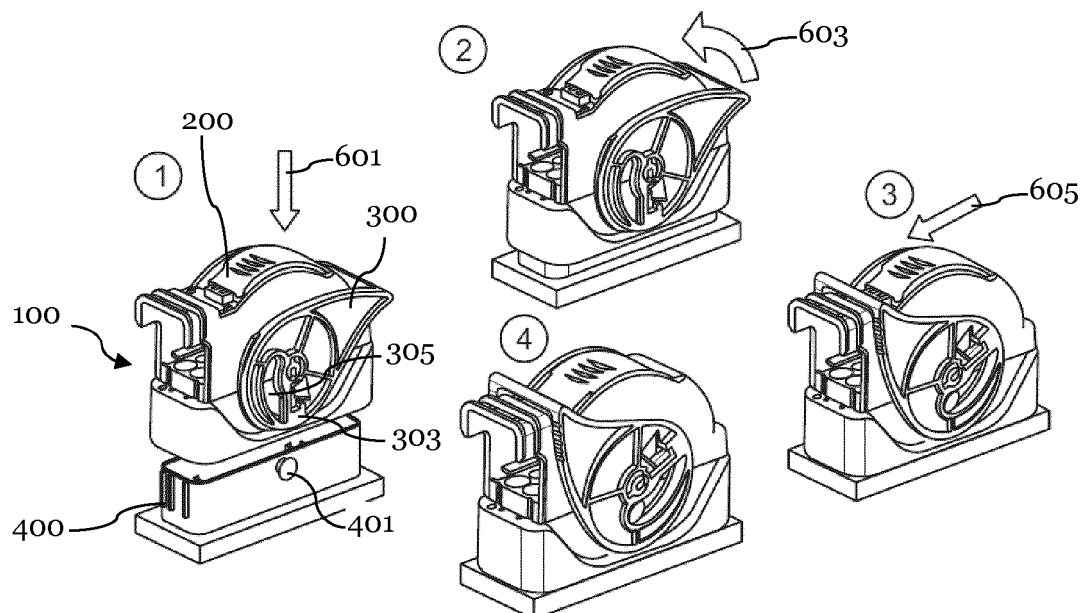


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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