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(54) **DOOR HOOK ASSEMBLY AND WASHING DEVICE USING THE SAME**

TÜRHAKEANORDNUNG UND DAVON GEBRAUCH MACHENDE WASCHVORRICHTUNG

ENSEMBLE CROCHET DE PORTE ET DISPOSITIF DE LAVAGE UTILISANT CET ENSEMBLE

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Description

Technical Field

[0001] The present invention relates to a door hook assembly for a door assembly, and a washing machine using the door hook assembly.

Background Art

[0002] It is well known that, in washing devices currently used in households, such as washing machines (including wave wheel type washing machines, drum type washing machines and other types of washing machines) or dish washers, an opening is generally provided on the front panel of the machine body, allowing clothes to be washed and other items to be put into or washed items to be taken out from the washing devices, and the opening is opened or closed by a door assembly. One end of the door assembly is usually pivotally mounted in a position corresponding to the opening, and the other end of the door assembly is locked by a door hook into the opening at the corresponding position on the front panel, so as to close the door assembly; the door hook is pivotally assembled and is rotatable about a stationary axis under the effects of an external force. To facilitate a user's operation, a door handle is usually provided on the door assembly and the user opens the door assembly by turning the door handle to rotate the door hook so as to disengage the door hook from the opening on the front panel of the machine body. To prevent the separation of the door handle from the door hook, a protrusion is usually provided on the door hook, and a fitting hole matching the protrusion is provided on the door handle, so the door handle and the door hook are assembled together by inserting the protrusion into said fitting hole. To further ensure the synchronous motion of the door handle and the door hook, a spring structure is also provided on the pivot, to which the door hook is pivotally coupled, and the spring structure is usually a dual-twisting spring with the two spiral portions thereof being arranged at each side of the door hook and with a Π -shape crossbeam in the middle to hoop said door hook, and the two ends of said spring are free ends in the same direction. However, when closing the door assembly, the door hook rotates outwards about the axis which is pivotally mounted against the resistance of the opening on the front panel to make the protrusion disengage from the fitting hole; since the spring hoops the door hook only with its Π -shape crossbeam, the door handle disengages with the door hook at this time and is not subject to the effects of the spring force of the spring, which may result in the loosening of the door handle; in addition, in case of a smaller size of the opening on the front panel, when the door assembly is in a closed state, the outward pressing force on the door hook by the opening on the front panel may make the door handle and the door hook disengage from each other to a certain degree, so as to result in the

loosening of the door handle.

[0003] GB 1 470 997 discloses the features of the preamble of claim 1.

[0004] US 4 111 473 shows the features of the preamble of claim 2.

Summary of the utility model

[0005] In view of the above problems, an object of the present invention is to provide a door hook assembly which can prevent the loosening of the door handle.

[0006] To achieve the above inventive object, this invention is realized in the following manner: a door hook assembly comprises a door hook, a spring structure and a pivot connecting said door hook and said spring structure, said door hook is rotatable about said pivot, said spring structure comprises a spiral portion, each of the two ends of said spiral portion has a leg portion extending tangentially from the circumference thereof, and there is a certain angle α formed between the projections of the extending directions of the two leg portions on a plane S perpendicular to said pivot; one of said leg portions is bent to form an arm portion extending therefrom, and there is a certain angle β formed on the plane S between the projection of the extending direction of said arm portion and the projection of the opposite direction of the extending direction of said leg portion and wherein a third spiral portion is formed between said arm portion and said leg portion on which it is provided. By way of this door hook assembly, when said spiral portion and the leg portions at its two ends have been deformed elastically about its axis O by an external force, the arm portion formed by bending one of said leg portions can still provide elastic deformation independently, so as to provide an extra elastic restoring force.

[0007] To achieve the above inventive object, this invention can also be realized in the following manner: a door hook assembly comprises a door hook, a spring structure and a pivot connecting said door hook and said spring structure, said door hook is rotatable about said pivot, said spring structure comprises a first spiral portion, a second spiral portion spiralling in a sense opposite to that of said first spiral portion, and a Π -shaped non-spiral portion connecting said first spiral portion and said second spiral portion, to be used to hoop said door hook, and each of the two ends of said first spiral portion and said second spiral portion has a leg portion extending tangentially from its circumference, and at least one of said leg portions is bent to form an arm portion extending therefrom, and there is a certain angle β formed between the projections of said arm portion and said leg portion on the plane S perpendicular to said pivot and wherein a third spiral portion is formed between said arm portion and said leg portion on which it is provided. Likewise, when said first and second spiral portions and the leg portions at their two ends have been deformed elastically about their axis O by an external force, said non-spiral portion hoops said door hook so as to provide an extra

elastic restoring force opposite to its rotational direction, and at the same time the arm portion formed by bending one of said leg portions can still provide elastic deformation independently, so as to provide an extra elastic restoring force.

[0008] As a specific embodiment of this invention, a free end is formed on said arm portion, and the extending direction of said free end is substantially opposite to that of said arm portion, so as to allow a greater elastic deformation of said arm portion to provide sufficient elastic restoring force.

[0009] Moreover, a third spiral portion is formed between one of said leg portions and said arm portions so as to provide a greater elastic restoring force.

[0010] More preferably, there is a certain angle between the axis O' of said third spiral portion and said pivot. The non-parallel design of said two axes also enables said arm portion to provide greater elastic restoring force.

[0011] Another object of this invention is to provide a washing device which can prevent the loosening of the door handle.

[0012] To achieve this inventive object, this invention is realized in the following manner: a washing device comprises: a hatch for introducing therethrough items to be washed and a door assembly allowing a user to open or close said hatch, said door assembly further comprises a door handle, a door hook assembly, a support and a door frame, said door hook assembly comprises a door hook, a spring structure and a pivot connecting said door hook and said spring structure, said door hook is rotatable about said pivot, said spring structure comprises a spiral portion, each of the two ends of said spiral portion has a leg portion extending tangentially from the circumference thereof, and there is a certain angle α formed between the projections of the extending directions of the two leg portions on a plane S perpendicular to said pivot; one of said leg portions is bent to form an arm portion extending therefrom, and there is a certain angle β formed between the projections of the extending direction of said arm portion and the opposite direction of the extending direction of said leg portion on the plane S and wherein a third spiral portion is formed between said arm portion and said leg portion on which it is provided, said door handle is assembled on said door frame for cooperating with said support through said door hook assembly, and said arm portion is set against the inside of said door handle to hold said door handle. When said door handle is turned by a user, said door handle carries said door hook to rotate about said pivot, so as to open said door assembly; when said door assembly is closed by the user, said door hook rotates outwards about said pivot under the effects of an external force, and at this time said door hook disengages from said door handle. However, said arm portion still sets against said door handle to provide an extra elastic restoring force, so as to ensure that said door handle cannot fall off or loosen.

[0013] As a specific embodiment of the present inven-

tion, said door handle comprises a cavity, and said door hook further comprises a tail portion on which a protruding part is provided, and when being assembled, said tail portion is accommodated in said cavity, and said protruding part is inserted into a hole provided at a corresponding position of said cavity.

[0014] Preferably, a free end is formed on said arm portion, and the extending direction of said free end is substantially opposite to that of said arm portion, and when being assembled, said arm portion or said free end is set against an upper wall inside said cavity, and said leg portion is set against said support.

[0015] More preferably, when being assembled, the other leg portion of said spiral portion is set against the tail portion of said door hook, so as to ensure that said door hook returns to the initial position.

[0016] To achieve this inventive object, the present utility model can also be realized in the following manner: a washing device comprises: a hatch for introducing therethrough items to be washed and a door assembly allowing a user to open or close said hatch, said door assembly further comprises a door handle, a door hook assembly, a support and a door frame, said door hook assembly comprises a door hook, a spring structure and a pivot connecting said door hook and said spring structure, said door hook is rotatable about said pivot, said spring structure comprises a first spiral portion, a second spiral portion spiralling in a sense opposite to that of said first spiral portion, and a Π -shaped non-spiral portion connecting said first spiral portion and said second spiral portion, to be used to hoop said door hook, and each of the two ends of said first spiral portion and said second spiral portion has a leg portion extending tangentially from its circumference, at least one of said leg portions is bent to form an arm portion extending therefrom, and there is a certain angle β formed between the projections of said arm portion and said leg portion on the plane S perpendicular to said pivot and wherein a third spiral portion is formed between said arm portion and said leg portion on which it is provided, said door handle is assembled on said door frame for cooperating with said support through said door hook assembly, and said arm portion is set against the inside of said door handle to hold said door handle. Likewise, when said door handle is turned by a user, said door handle carries said door hook to rotate about said pivot, so as to open said door assembly; when said door assembly is closed by the user, said door hook rotates outwards about said pivot under the effects of an external force, and at this time said door hook disengages from said door handle. However, said arm portion still is set against said door handle to provide an extra elastic restoring force, so as to ensure that said door handle cannot fall off or loosen.

[0017] As a specific embodiment of the present invention, said door handle comprises a cavity, and said door hook further comprises a tail portion on which a protruding part is provided, when being assembled, said tail portion is accommodated in said cavity, and said protruding

part is inserted into a hole provided at a corresponding position of said cavity.

[0018] Preferably, a free end is formed on said arm portion, and the extending direction of said free end is substantially opposite to that of said arm portion, when being assembled, said arm portion or said free end is set against an upper wall inside said cavity, and said leg portion is set against said support.

Description of the Drawings

[0019] The present invention will be further described by way of embodiments with reference to the drawings, in which:

Fig.1 is a perspective view of a washing machine according to a specific embodiment of the present invention;

Fig.2 is an enlarged local view of the part C of the washing machine shown in Fig.1;

Fig. 3 is a schematically perspective view of a first specific embodiment of the spring structure of the door hook assembly according to the present invention;

Fig.4 is a schematically perspective view of a second specific embodiment of the spring structure of the door hook assembly according to the present invention; and

Fig.5 is a schematically assembled view of a door hook assembly according to a specific embodiment of the present invention, in combination with the spring structure as shown in Fig.4.

Detailed Description of Embodiments

[0020] Referring to Fig.1, which is a perspective view of a washing device 13 according to a specific embodiment of the present invention, shown by way of example as a washing machine, said washing device 13 generally comprises a closed space formed by a base 24, a container body 25, and a top cover body 26; an outer drum, an inner drum and other mechanisms (not shown in the figure) of the washing machine are provided inside said container body 25. A control panel 27 is provided on the upper portion of the container body 25 for controlling said washing machine and displaying information, and below said control panel 27, an entry opening 14 is provided on the front panel of said container body 25 for introducing clothes to be washed, and a door assembly 15 is pivotally mounted on one end of said entry opening 14, and said door assembly 15 is rotatable under the effects of an external force about the axis, onto which it is pivotally mounted, so as to open or close said entry opening 14. Said door assembly 15 is provided with a door hook 2 at

the side facing said entry opening 14, and at the other end of said entry opening 14 on the front panel of said container body 25 there is further provided an opening 28 for receiving said door hook 2; so that when said door assembly 15 is closed, said door hook 2 is locked into said opening 28. To facilitate a user opening said door assembly 15, said door assembly 15 is further provided with a door handle 16, and the user can open said door assembly 15 by turning said door handle 16.

[0021] With reference to Fig. 2, which is an enlarged local view at part C of the washing machine of the specific embodiment according to the present invention as shown in Fig. 1; for the sake of a clear illustration of the structure inside, an inner door frame for sealing said door assembly 15 is omitted, and the structure that said door handle 16 is assembled to a door frame 18 of said door assembly 15 via a door hook assembly 1 and a support 17 is shown clearly in the figure. As shown in this figure, a cavity 19 is provided on the inner side of said door handle 16, and a substantially square shaped hole 22 is provided in the upper wall of said cavity 19. Said door hook assembly 1 comprises a door hook 2, a spring structure 3, and a pivot 4 connecting said door hook 2 and said spring structure 4. Said door hook 2 is provided at one end thereof with a hook portion 29, at the other end with a tail portion 20, and said hook portion 29 and said tail portion 20 are connected by a base portion 30 in between. Said base portion 30 is provided with a throughhole 31, and when being assembled, a pivot 4 is passed through the throughhole 31, so that said door hook 2 is rotatable about said pivot 4. Said tail portion 20 is further provided with a protruding part 21 at the upper end thereof, and when being assembled, said tail portion 20 is accommodated in the cavity 19 of said door handle 16, while said protruding part 21 is inserted into a hole 22 provided in said cavity 19, so that at the same time as ensuring the exact positioning between said door handle 16 and said door hook 2, it also allows the user to rotate said door hook 2 about said pivot 4 by turning said door handle 16. With reference to Fig. 3, which is a schematic view of a first specific embodiment of the spring structure of the door hook assembly according to the present utility model, it is shown in the figure that said spring structure 3 comprises a spiral portion 5, each of the two ends of said spiral portion 5 has a leg portion 6, 7 extending tangentially from its circumference, and there is a certain angle α between projections 6' and 7' of the two leg portions 6, 7 in their respective extending directions on a plane S perpendicular to the axis of said pivot 4, that is, the two projections 6' and 7' are neither parallel to each other nor in a line, and obviously, said leg portions 6, 7 and an arm portion 8 can extend outwards in a straight line or in any other shape, for example, extending outwards in a S shape or a Z shape. The spring structure 3 is assembled on said pivot 4 at one side of said door hook 2, wherein one leg portion 6 is set against said support 17, and the other leg portion 7 is set against said door hook 2, thus, when said door hook 2 is rotated about said pivot 4 by the effects of an

external force, that is to say, when there is an elastic deformation happening, an elastic restoring force is provided to said door hook 2 by virtue of the elastic deformation of said spring structure 3 itself; meanwhile, said leg portion 6 is bent to form the arm portion 8, and there is a certain angle β between the projections 8' and 6' formed along the extending direction of said arm portion 8 and the direction opposite to the extending direction of said leg portion 6 on the plane S, that is, the two projections 8' and 6' are neither parallel to each other nor in a line, and likewise, said arm portion 8 can extend in a straight line or in any other shape. Accordingly, said arm portion 8 is set against the upper wall within the cavity 19 of said door handle 16 to provide an independent elastic restoring force. Therefore, even if the protruding part 21 of said door hook 2 disengages from the hole 22 provided in said cavity 19 of said door handle 16, by the virtue of said arm portion 8 it still ensures that said door assembly 15 is closed by the user, the disadvantage of the falling-off or loosening of said door handle 16, caused when said door hook 2 is rotated outwards about said pivot 4 to disengage from said door handle 16 or when there exists a certain tolerance between said protruding part 21 and said hole 22 provided in said cavity 19 of said door handle 16, is avoided effectively.

[0022] Fig. 4 shows a second specific embodiment of the spring structure of the door hook assembly according to the present invention. As shown in the figure, said spring structure 3 comprises a first spiral portion 5', a second spiral portion 9 spiralling in an opposite sense from that of the first spiral portion 5', and a Π -shape non-spiral portion 10 connecting said first spiral portion 5' and said second spiral portion 9 to hoop said door hook 2, and a leg portions 6, 7 extending respectively from the two ends of said first spiral portion 5' and second spiral portion 9 tangentially from their respective circumferences. When being assembled, said leg portions 6, 7 are both set against said support 17, and said Π -shaped non-spiral portion 10 is hooped onto a tail portion 20 of said door hook 2. When said door hook 2 is rotated about said pivot 4 by the effects of an external force, that is, when an elastic deformation has happened, an elastic restoring force is provided to said door hook 2 via said non-spiral portion 10 by the virtue of the elastic deformation of said spring structure 3 itself, wherein by way of said Π -shaped non-spiral portion 10, said elastic restoring force thereof is distributed more uniformly; and at the same time, one of said leg portions 6 is bent to form an arm portion 8, and there is a certain angle β between the projections 8' and 6' of said arm portion 8 and said leg portion 6 on a plane S perpendicular to said pivot 4, that is, the two projections 8' and 6' are neither parallel to each other nor in a line, thus, said arm portion 8 is set against the upper wall within the cavity 19 of said door handle 16 to provide an independent elastic restoring force. Likewise, even if the protruding part 21 of said door hook 2 disengages from the hole 22 provided in said cavity 19 of said door

handle 16, by the virtue of said arm portion 8 it still ensures that said door handle 16 does not disengage, so that when said door assembly 15 is closed by the user, the disadvantage of the falling-off or loosening of said door handle 16, caused when said door hook 2 is rotated outwards about said pivot 4 to disengage from said door handle 16 or when there exists a certain tolerance between said protruding part 21 and said hole 22 provided in said cavity 19 of said door handle 16, is avoided effectively. Obviously, in this embodiment, said two leg portions 6, 7 can also each extend outwards to form an arm portion 8, which in turn results in a more uniform distribution of the force on said door handle 16, so as to ensure more reliably that said door handle 16 will not get loose.

[0023] Preferably, to provide a greater elastic restoring force, a free end 11 extends out from said arm portion 8, and the extending direction of said free end 11 is in a substantially opposite direction to that of said arm portion 8, that is to say, a certain angle is allowed to exist therebetween. At the same time, to improve the strength of said arm portion 8, a third spiral portion 12 is formed between said arm portion 8 and said leg portion 6 from which it extends, and more preferably, there is a certain angle between an axis O' of said third spiral portion 12 and the axis that said pivot 4 lies in, that is to say, the two of them are not parallel to each other, which in turn provides a greater elastic restoring force.

[0024] Fig. 5 shows an assembled structure of the door hook assembly 1 according to the present invention, in combination with the spring structure 3 as shown in Fig. 4; when being assembled, firstly an end of said pivot 4 is inserted into the hole in one side of said support 17; then said spring structure 3 is put in the middle of said support 17; and thereafter said pivot 4 is pushed into the spiral hole formed by the spiral portion 5' or 9 at one end of said spring structure 3; then said door hook 2 is put into said support 17; and followed by said pivot 4 being pushed through the hole provided in the other end of said support 17. In this way, the assembling operation of the whole door hook assembly 1 is completed.

[0025] The spring structure 3 of the door hook assembly 1 according to the present invention improves the conventional spring structure, so that the door handle can still be subject to the effects of the elastic force from the spring when it is rotated outwards by force, therefore, it ensures that the door handle does not get loose during closure and after the door assembly has been closed.

[0026] It is obvious to those skilled in the art that the door hook assembly according to specific embodiments of the present invention can be applied to other similar washing devices (e.g., a dishwasher) without additional inventive efforts; therefore, only a washing machine is taken by way of example in the specific embodiments of the present invention.

[0027] In summary, within the scope of the general technical concept of the present invention, any modifications to the present invention made by those skilled in the art in relation to that disclosed by the present inven-

tion will fall into the protective scope of the present patent application.

Claims

1. A door hook assembly (1) comprising: a door hook (2), a spring structure (3) and a pivot (4) connecting said door hook (2) and said spring structure (3), wherein said door hook (2) is rotatable about said pivot (4), said spring structure (3) comprises a spiral portion (5), each of the two ends of said spiral portion (5) has a leg portion (6, 7) extending tangentially from the circumference thereof, and there is a certain angle α formed between the projections (6', 7') of the extending directions of the two leg portions (6, 7) on a plane S perpendicular to said pivot (4), wherein one of said leg portions (6) is bent to form an arm portion (8) extending therefrom, and there is a certain angle β formed on the plane S between the projection (8') of the extending direction of said arm portion (8) and the projection (6') of the opposite direction of the extending direction of said leg portion (6), **characterised in that** a third spiral portion (12) is formed between said arm portion (8) and said leg portion (6) on which it is provided.
2. A door hook assembly (1) comprising: a door hook (2), a spring structure (3) and a pivot (4) connecting said door hook (2) and said spring structure (3), said door hook (2) is rotatable about said pivot (4), said spring structure (3) comprises a first spiral portion (5'), a second spiral portion (9) spiralling in a sense opposite to that of said first spiral portion (5'), and a Π -shaped non-spiral portion (10) connecting said first spiral portion (5') and said second spiral portion (9), to be used to hoop said door hook (2), and each of the two ends of said first spiral portion (5') and said second spiral portion (9) has a leg portion (6, 7) extending tangentially from its circumference, wherein at least one of said leg portions (6) is bent to form an arm portion (8) extending therefrom, and there is a certain angle β formed between the projections (8', 6') of said arm portion (8) and said leg portion (6) on the plane S perpendicular to said pivot (4), **characterised in that** a third spiral portion (12) is formed between said arm portion (8) and said leg portion (6) on which it is provided.
3. The door hook assembly (1) as claimed in claims 1 or 2, wherein a free end (11) is formed on said arm portion (8), and the extending direction of said free end (11) is substantially opposite to that of said arm portion (8).
4. The door hook assembly (1) as claimed in any one of the preceding claims, wherein there is a certain angle between the axis O' of said third spiral portion

(12) and said pivot (4).

5. A washing device (13) using the door hook assembly (1) as claimed in claim 1, comprising: a hatch (14) for introducing therethrough items to be washed and a door assembly (15) allowing a user to open or close said hatch (14), wherein said door assembly (15) further comprises a door handle (16), said door hook assembly (1), a support (17) and a door frame (18), said door handle (16) is assembled on said door frame (18) for cooperating with said support (17) through said door hook assembly (1), and said arm portion (8) is set against the inside of said door handle (16) to hold said door handle (16).
6. The washing device (13) as claimed in claim 5, wherein said door handle (16) comprises a cavity (19), and said door hook (2) further comprises a tail portion (20) on which a protruding part (21) is provided, and when being assembled, said tail portion (20) is accommodated in said cavity (19), and said protruding part (21) is inserted into a hole (22) provided at a corresponding position of said cavity (19).
7. The washing device (13) as claimed in claim 6, wherein a free end (11) is formed on said arm portion (8), the extending direction of said free end (11) is substantial opposite to that of said arm portion (8), and when being assembled, said arm portion (8) or said free end (11) is set against an upper wall inside said cavity (19), and said leg portion (6), from which said arm portion (8) extends, is set against said support (17).
8. The washing device (13) as claimed in claim 7, wherein, when being assembled, the other leg portion (7) of said spiral portion (2) is set against the tail portion (20) of said door hook (2).
9. A washing device (13) using the door hook assembly (1) as claimed in claim 2, comprising: a hatch (14) for introducing therethrough items to be washed and a door assembly (15) allowing a user to open or close said hatch (14), wherein said door assembly (15) further comprises a door handle (16), said door hook assembly (1), a support (17) and a door frame (18), said door handle (16) is assembled on said door frame (18) for cooperating with said support (17) through said door hook assembly (1), and said arm portion (8) is set against the inside of said door handle (16) to hold said door handle (16).
10. The washing device (13) as claimed in claim 9, wherein said door handle (16) comprises a cavity (19), and said door hook (2) further comprises a tail portion (20) on which a protruding part (21) is provided, when being assembled, said tail portion (20) is accommodated in said cavity (19), and said pro-

truding part (21) is inserted into a hole (22) provided at a corresponding position of said cavity (19).

11. The washing device (13) as claimed in claim 10, wherein a free end (11) is formed on said arm portion (8), the extending direction of said free end (11) is substantially opposite to that of said arm portion (8), and when being assembled, said arm portion (8) or said free end (11) is set against an upper wall inside said cavity (19), and said leg portion (6) is set against said support (17).

Patentansprüche

1. Türhakenanordnung (1) mit: einem Türhaken (2), einer Federstruktur (3) und einem Drehzapfen (4), der den Türhaken (2) mit der Federstruktur (3) verbindet, wobei der Türhaken (2) um den Drehzapfen (4) drehbar ist und die Federstruktur (3) einen Spiralabschnitt (5) umfasst, wobei jedes der beiden Enden des Spiralabschnitts (5) einen Schenkelabschnitt (6, 7) hat, der sich tangential von dessen Umfang erstreckt, wobei zwischen den Vorsprüngen (6', 7') der Erstreckungsrichtungen der beiden Schenkelabschnitte (6, 7) in einer zum Drehzapfen (4) senkrecht verlaufenden Ebene S ein gewisser Winkel α gebildet wird, wobei einer der Schenkelabschnitte (6) gebogen ist und einen sich davon erstreckenden Armabschnitt (8) bildet, wobei in der Ebene S zwischen dem Vorsprung (8') der Erstreckungsrichtung des Armabschnitts (8) und dem Vorsprung (6') der der Erstreckungsrichtung entgegengesetzten Richtung des Schenkelabschnitts (6) ein gewisser Winkel β gebildet wird, **dadurch gekennzeichnet, dass** ein dritter Spiralabschnitt (12) zwischen dem Armabschnitt (8) und dem Schenkelabschnitt (6), an dem er vorgesehen ist, ausgebildet ist.
2. Türhakenanordnung (1) mit: einem Türhaken (2), einer Federstruktur (3) und einem Drehzapfen (4), der den Türhaken (2) mit der Federstruktur (3) verbindet, wobei der Türhaken (2) um den Drehzapfen (4) drehbar ist und die Federstruktur (3) einen ersten Spiralabschnitt (5'), einen zweiten Spiralabschnitt (9), dessen Spirale in einer zu dem ersten Spiralabschnitt (5') entgegengesetzt verlaufenden Richtung verläuft, und einen II-förmigen nicht spiralförmigen Abschnitt (10) umfasst, der den ersten Spiralabschnitt (5') mit dem zweiten Spiralabschnitt (9) verbindet und zum Überspannen des Türhakens (2) verwendet wird, wobei jedes der beiden Enden des ersten Spiralabschnitts (5') und des zweiten Spiralabschnitts (9) einen Schenkelabschnitt (6, 7) hat, der sich tangential von dessen Umfang erstreckt, wobei mindestens einer der Schenkelabschnitte (6) gebogen ist und einen sich davon erstreckenden Armabschnitt (8) bildet, wobei zwischen den Vorsprüngen

(8', 6') des Armabschnitts (8) und des Schenkelabschnitts (6) in einer zum Drehzapfen (4) senkrecht verlaufenden Ebene S ein gewisser Winkel β gebildet wird, **dadurch gekennzeichnet, dass** ein dritter Spiralabschnitt (12) zwischen dem Armabschnitt (8) und dem Schenkelabschnitt (6), an dem er vorgesehen ist, ausgebildet ist.

3. Türhakenanordnung (1) nach Anspruch 1 oder 2, wobei ein freies Ende (11) am Armabschnitt (8) ausgebildet ist und die Erstreckungsrichtung des freien Endes (11) der des Armabschnitts (8) im Wesentlichen entgegengesetzt ist.
4. Türhakenanordnung (1) nach einem der vorhergehenden Ansprüche, wobei zwischen der Achse O' des dritten Spiralabschnitts (12) und dem Drehzapfen (4) ein gewisser Winkel vorliegt.
5. Waschvorrichtung (13), bei der die Türhakenanordnung (1) nach Anspruch 1 verwendet wird, mit: einer Luke (14), durch die zu waschende Artikel eingeführt werden, und einer Türanordnung (15), dank derer ein Benutzer die Luke (14) öffnen oder schließen kann, wobei die Türanordnung (15) ferner einen Türgriff (16), die Türhakenanordnung (1), eine Stütze (17) und einen Türrahmen (18) umfasst, wobei der Türgriff (16) am Türrahmen (18) angeordnet ist, um durch die Türhakenanordnung (1) mit der Stütze (17) zusammenzuwirken, wobei der Armabschnitt (8) gegen die Innenseite des Türgriffs (16) festgelegt ist, um den Türgriff (16) zu halten.
6. Waschvorrichtung (13) nach Anspruch 5, wobei der Türgriff (16) einen Hohlraum (19) umfasst und der Türhaken (2) ferner einen Schwanzabschnitt (20) umfasst, an dem ein vorstehender Teil (21) vorgesehen ist, wobei der Schwanzabschnitt (20) im montierten Zustand im Hohlraum (19) untergebracht ist und der vorstehende Teil (21) in ein Loch (22) eingeführt ist, das an einer entsprechenden Position des Hohlraums (19) vorgesehen ist.
7. Waschvorrichtung (13) nach Anspruch 6, wobei ein freies Ende (11) an dem Armabschnitt (8) gebildet ist, die Erstreckungsrichtung des freien Endes (11) der des Armabschnitts (8) im Wesentlichen entgegengesetzt ist und der Armabschnitt (8) oder das freie Ende (11) im montierten Zustand gegen eine obere Wand im Hohlraum (19) festgelegt ist, und der Schenkelabschnitt (6), von dem sich der Armabschnitt (8) erstreckt, gegen die Stütze (17) festgelegt ist.
8. Waschvorrichtung (13) nach Anspruch 7, wobei der andere Schenkelabschnitt (7) des Spiralabschnitts (2) gegen den Schwanzabschnitt (20) des Türhakens (2) festgelegt ist.

9. Waschvorrichtung (13), bei der die Türhakenanordnung (1) nach Anspruch 2 verwendet wird, mit: einer Luke (14), durch die zu waschende Artikel eingeführt werden, und einer Türanordnung (15), dank derer ein Benutzer die Luke (14) öffnen oder schließen kann, wobei die Türanordnung (15) ferner einen Türgriff (16), die Türhakenanordnung (1), eine Stütze (17) und einen Türrahmen (18) umfasst, wobei der Türgriff (16) am Türrahmen (18) angeordnet ist, um durch die Türhakenanordnung (1) mit der Stütze (17) zusammenzuwirken, wobei der Armabschnitt (8) gegen die Innenseite des Türgriffs (16) festgelegt ist, um den Türgriff (16) zu halten.
10. Waschvorrichtung (13) nach Anspruch 9, wobei der Türgriff (16) einen Hohlraum (19) umfasst und der Türhaken (2) ferner einen Schwanzabschnitt (20) umfasst, an dem ein vorstehender Teil (21) vorgesehen ist, wobei der Schwanzabschnitt (20) im montierten Zustand im Hohlraum (19) untergebracht ist und der vorstehende Teil (21) in ein Loch (22) eingeführt ist, das an einer entsprechenden Position des Hohlraums (19) vorgesehen ist.
11. Waschvorrichtung (13) nach Anspruch 10, wobei ein freies Ende (11) an dem Armabschnitt (8) gebildet ist, die Erstreckungsrichtung des freien Endes (11) der des Armabschnitts (8) im Wesentlichen entgegengesetzt ist und der Armabschnitt (8) oder das freie Ende (11) im montierten Zustand gegen eine obere Wand im Hohlraum (19) festgelegt ist, und der Schenkelabschnitt (6), von dem sich der Armabschnitt (8) erstreckt, gegen die Stütze (17) festgelegt ist.

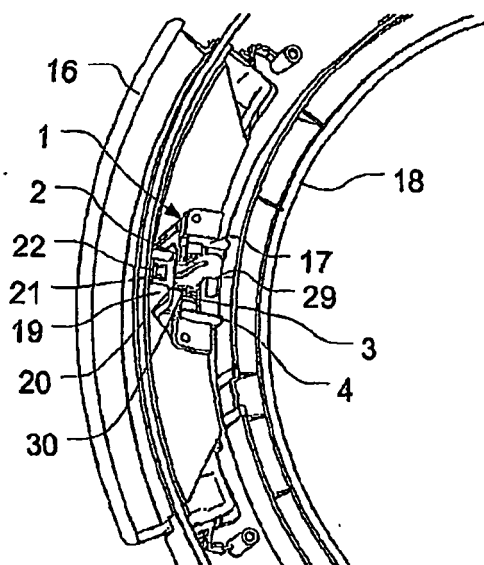
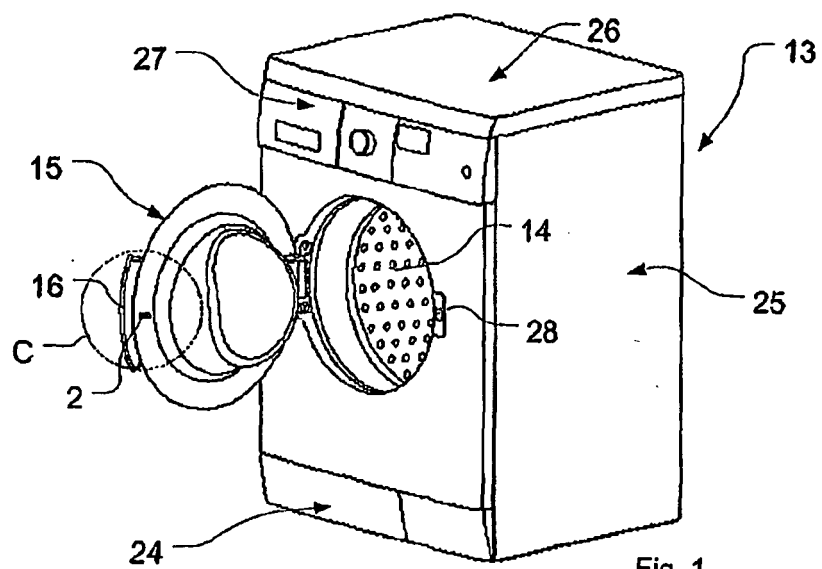
Revendications

1. Ensemble crochet de porte (1) comprenant : un crochet de porte (2), une structure à ressort (3) et un axe (4) qui relie ledit crochet de porte (2) et ladite structure à ressort (3), dans lequel ledit crochet de porte (2) est rotatif autour dudit axe (4), ladite structure à ressort (3) comprend une portion spiralee (5), chacune des deux extrémités de ladite portion spiralee (5) a une portion de tige (6, 7) s'étendant tangentielllement au départ de sa circonférence, et un certain angle α est formé entre les projections (6', 7') des directions d'extension des deux portions de tige (6, 7) dans un plan S perpendiculaire audit axe (4), dans lequel l'une desdites portions de tige (6) est courbée pour former une portion de bras (8) s'étendant au départ de celui-ci, et un certain angle β est formé dans le plan S entre la projection (8') de la direction d'extension de ladite portion de bras (8) et la projection (6') de la direction opposée à la direction d'extension de ladite portion de tige (6), **caractérisé en ce qu'une troisième portion spiralee** (12) est formée entre ladite portion de bras (8) et ladite portion de tige (6) sur laquelle elle est formée.
2. Ensemble crochet de porte (1) comprenant : un crochet de porte (2), une structure à ressort (3) et un axe (4) qui relie ledit crochet de porte (2) et ladite structure à ressort (3), ledit crochet de porte (2) étant rotatif autour dudit axe (4), ladite structure à ressort (3) comprenant une première portion spiralee (5'), une deuxième portion spiralee (9) dont le sens est opposé à celui de ladite première portion spiralee (5'), et une portion non spiralee en forme de n (10) qui relie ladite première portion spiralee (5') et ladite deuxième portion spiralee (9), à utiliser pour cercler ledit crochet de porte (2), et chacune des deux extrémités de ladite première portion spiralee (5') et ladite deuxième portion spiralee (9) ont une portion de tige (6, 7) s'étendant tangentielllement au départ de sa circonférence, dans lequel au moins l'une des portions de tige (6) est courbée afin de former une portion de bras (8) s'étendant au départ de celui-ci, et un certain angle β est formé entre les projections (8', 6') de ladite portion de bras (8) et ladite portion de tige (6) dans le plan S perpendiculaire audit axe (4), **caractérisé en ce qu'une troisième portion spiralee** (12) est formée entre ladite portion de bras (8) et ladite portion de tige (6) sur laquelle elle est formée.
3. Ensemble crochet de porte (1) selon les revendications 1 ou 2, dans lequel une extrémité libre (11) est formée sur ladite portion de bras (8) et la direction d'extension de ladite extrémité libre (11) est substantiellement opposée à celle de ladite portion de bras (8).
4. Ensemble crochet de porte (1) selon l'une quelconque des revendications précédentes, dans lequel un certain angle existe entre l'axe O' de ladite troisième portion spiralee (12) et ledit axe (4).
5. Dispositif de lavage (13) utilisant l'ensemble crochet de porte (1) selon la revendication 1, comprenant : un hublot (14) afin d'introduire via ce dernier des éléments à laver et un ensemble de porte (15) permettant à l'utilisateur d'ouvrir ou de fermer ledit hublot (14), dans lequel ledit ensemble de porte (15) comprend en outre une poignée de porte (16), ledit ensemble crochet de porte (1), un support (17) et un cadre de porte (18), ladite poignée de porte (16) étant assemblée sur ledit cadre de porte (18) afin de coopérer avec ledit support (17) via ledit ensemble crochet de porte (1), et ladite portion de bras (8) est positionnée contre l'intérieur de ladite poignée de porte (16) afin de maintenir ladite poignée de porte (16).
6. Dispositif de lavage (13) selon la revendication 5,

dans lequel ladite poignée de porte (16) comprend une cavité (19), et ledit crochet de porte (2) comprend en outre une portion arrière (20) sur laquelle une partie saillante (21) est formée, et lors de l'assemblage, ladite portion arrière (20) est logée dans ladite cavité (19), et ladite portion saillante (21) est introduite dans un trou (22) formé en une position correspondante de ladite cavité (19).

l'assemblage, ladite portion de bras (8) ou ladite extrémité libre (11) est positionnée contre une paroi supérieure à l'intérieur de ladite cavité (19) et ladite portion de tige (6) est disposée contre ledit support (17).

7. Dispositif de lavage (13) selon la revendication 6, dans lequel une extrémité libre (11) est formée sur ladite portion de bras (8), la direction d'extension de ladite extrémité libre (11) est substantiellement opposée à celle de ladite portion de bras (8) et, lors de l'assemblage, ladite portion de bras (8) ou ladite extrémité libre (11) est positionnée contre une paroi supérieure à l'intérieur de ladite cavité (19) et ladite portion de tige (6), au départ de laquelle ladite portion de bras (8) s'étend, est disposée contre ledit support (17).
8. Dispositif de lavage (13) selon la revendication 7, dans lequel, lors de l'assemblage, l'autre portion de tige (7) de ladite portion spiralée (2) est disposée contre la portion arrière (20) dudit crochet de porte (2).
9. Dispositif de lavage (13) utilisant l'ensemble crochet de porte (1) selon la revendication 2, comprenant : un hublot (14) afin d'introduire via ce dernier des éléments à laver et un ensemble de porte (15) permettant à l'utilisateur d'ouvrir ou de fermer ledit hublot (14), dans lequel ledit ensemble de porte (15) comprend en outre une poignée de porte (16), ledit ensemble crochet de porte (1), un support (17) et un cadre de porte (18), ladite poignée de porte (16) étant assemblée sur ledit cadre de porte (18) afin de coopérer avec ledit support (17) via ledit ensemble crochet de porte (1), et ladite portion de bras (8) est positionnée contre l'intérieur de ladite poignée de porte (16) afin de maintenir ladite poignée de porte (16).
10. Dispositif de lavage (13) selon la revendication 9, dans lequel ladite poignée de porte (16) comprend une cavité (19), et ledit crochet de porte (2) comprend en outre une portion arrière (20) sur laquelle une partie saillante (21) est formée, lors de l'assemblage, ladite portion arrière (20) est logée dans ladite cavité (19), et ladite portion saillante (21) est introduite dans un trou (22) formé en une position correspondante de ladite cavité (19).
11. Dispositif de lavage (13) selon la revendication 10, dans lequel une extrémité libre (11) est formée sur ladite portion de bras (8), la direction d'extension de ladite extrémité libre (11) est substantiellement opposée à celle de ladite portion de bras (8) et, lors de



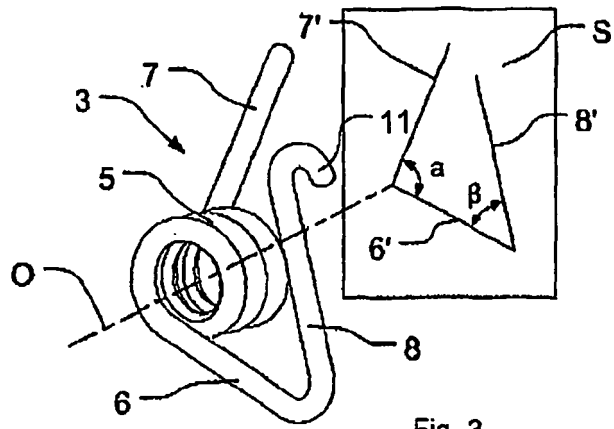


Fig. 3

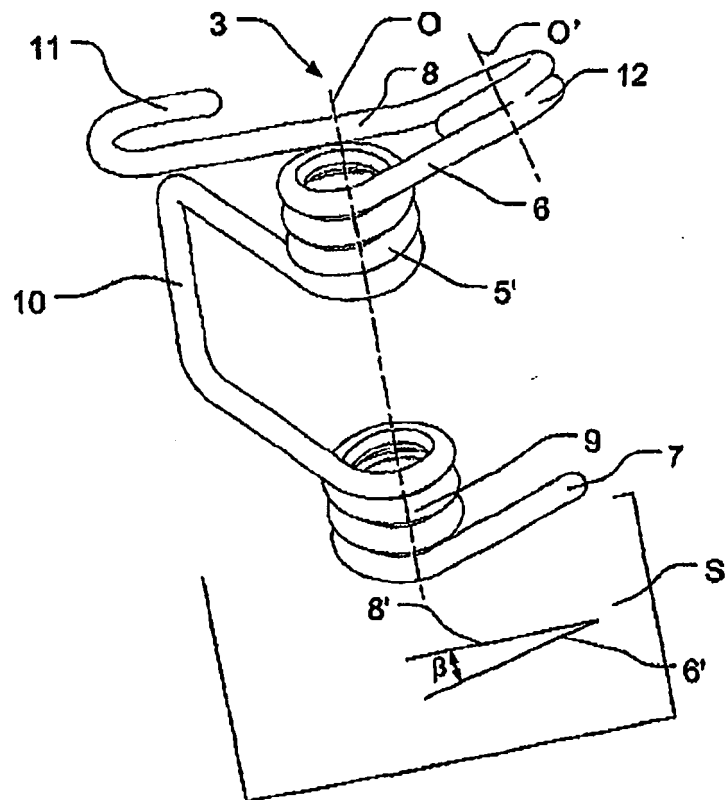


Fig. 4

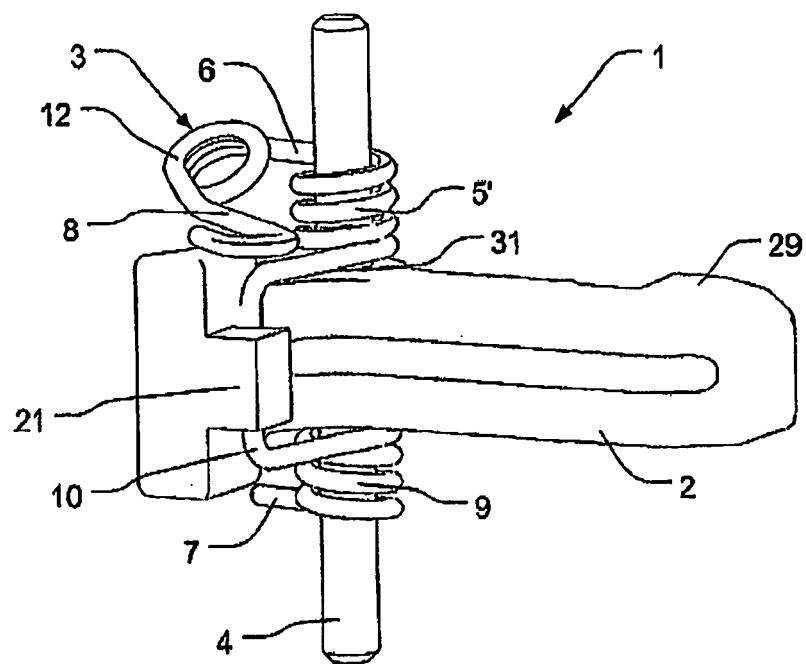


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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