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(54) **STEAM IRON AND SYNCHRONOUS ADJUSTMENT MECHANISM THEREOF**

(57) A synchronous adjustment mechanism (5) for use in a steam iron (2) includes an active module (800) and a passive module (700). The active module (800) is operable to adjust steam emission rate of the steam iron (2). The passive module (700) is operable to adjust temperature of a soleplate (32) of the steam iron (2) . The active module (800) and the passive module (700) are cooperatively associated with each other, so that when the active module (800) is operated to adjust the steam emission rate of the steam iron (2), the passive module (700) is driven by the active module (800) to synchronously adjust the temperature of the soleplate (32).

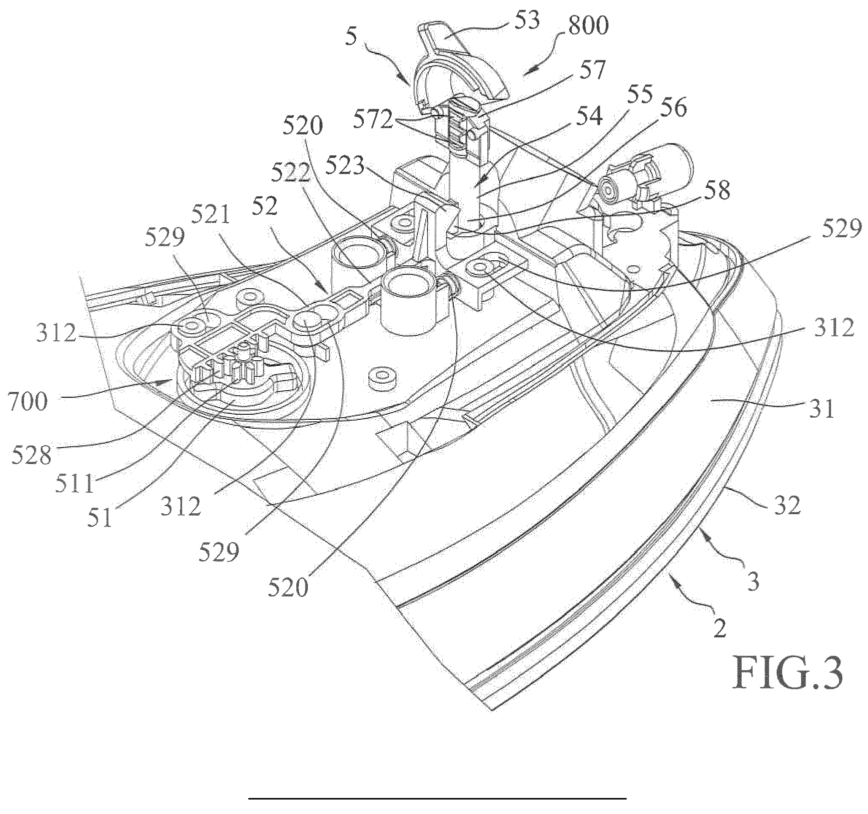

FIG.3

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Description

[0001] The disclosure relates to an iron, and more particularly to a steam iron.

[0002] A conventional steam iron emits steam for softening fabrics so as to facilitate removal of creases formed on the fabrics, and includes a temperature adjusting mechanism and a steam adjusting mechanism. The temperature adjusting mechanism is operable to adjust temperature of a soleplate of the conventional steam iron. The s team adjusting mechanism is operable to adjust steam emission rate of the conventional steam iron. When using the conventional steam iron, a user needs to separately operate the temperature adjusting mechanism and the steam adjusting mechanism for various demands. Such operation is inconvenient.

[0003] Therefore, an object of the disclosure is to provide a synchronous adjustment mechanism for a steam iron that can alleviate the drawback of the prior art.

[0004] According to the disclosure, the synchronous adjustment mechanism is for use in a steam iron that includes a soleplate, and includes an active module and a passive module. The active module is operable to adjust steam emission rate of the steam iron. The passive module is operable to adjjust temperature of the soleplate. The active module and the passive module are cooperatively associated with each other, so that when the active module is operated to adjust the steam emission rate of the steam iron, the passive module is driven by the active module to synchronously adjust the temperature of the soleplate.

[0005] Another object of the disclosure is to provide a steam iron that includes a synchronous adjustment mechanism and that can alleviate the drawback of the prior art.

[0006] According to the disclosure, the steam iron includes a main body including a soleplate, and a synchronous adjustment mechanism disposed on the main body. The synchronous adjustment mechanism includes an active module and a passive module. The active module is operable to adjust steam emission rate of the steam iron. The passive module is operable to adjust temperature of the soleplate. The active module and the passive module are cooperatively associated with each other, so that when the active module is operated to adjust the steam emission rate of the steam iron, the passive module is driven by the active module to synchronously adjust the temperature of the soleplate.

[0007] Other features and advantages of the disclosure will become apparent in the following detailed description of the embodiments with reference to the accompanying drawings, of which:

Figure 1 is a perspective view illustrating a first embodiment of the steam iron according to the disclosure ;

Figure 2 is a fragmentary perspective view illustrating the first embodiment;

Figure 3 is another fragmentary perspective view illustrating the first embodiment;

Figure 4 is a fragmentary sectional view illustrating an adjusting rod of the first embodiment;

Figure 5 is a schematic perspective view illustrating a rotary switch of the first embodiment at a middle position and the adjusting rod at a low flow rate position;

Figure 6 is another schematic perspective view illustrating the rotary switch at a right position and the adjusting rod at a high flow rate position;

Figure 7 is still another schematic perspective view illustrating the rotary switch at a left position and the adjusting rod at a seal position;

Figure 8 is a fragmentary perspective view illustrating a second embodiment of the steam iron according to the disclosure;

Figure 9 is another fragmentary perspective view illustrating an adjusting rod unit of the second embodiment;

Figure 10 is still another fragmentary perspective view illustrating the adjusting rod unit;

Figure 11 is a schematic fragmentary sectional view illustrating an adjusting rod of the adjusting rod unit at a low flow rate position;

Figure 12 is another schematic fragmentary sectional view illustrating the adjusting rod at a high flow rate position; and

Figure 13 is still another schematic fragmentary sectional view illustrating the adjusting rod at a seal position.

[0008] Before the disclosure is described in greater detail, it should be noted that where considered appropriate, reference numerals or terminal portions of reference numerals have been repeated among the figures to indicate corresponding or analogous elements, which may optionally have similar characteristics.

[0009] Referring to Figures 1 to 4, the first embodiment of the steam iron 2 according to the disclosure includes a main body 3, and a synchronous adjustment mechanism 5 disposed on the main body 3. It should noted that, in the following paragraphs, a tapered end of the main body 3 (see Figure 1) is defined as the front side of the main body 3, and the left and right sides of the main body 3 are defined accordingly.

[0010] The main body 3 includes a casing 31, and a soleplate 32 that is mounted to a bottom side of the casing 31 and that permits steam to emit therethrough. The casing 31 cooperates with the soleplate 32 to define a steam chamber 33 (see Figure 4) therebetween. The steam chamber 33 accommodates water that is to be evaporated, and has an inlet hole 331 (see Figure 4) that is in fluid communication with a water chamber 35 (see Figure 4).

[0011] The main body 3 of the steam iron 2 is widely known in the art, and will not be described in greater detail in the following paragraphs.

[0012] Referring to Figures 3 to 5, the synchronous adjustment mechanism 5 includes a passive module 700 that is operable to adjust temperature of the soleplate 32, and an active module 800 that is operable to adjust steam emission rate of the steam iron 2. The active module 800 and the passive module 700 are cooperatively associated with each other, so that when the active module 800 is operated to adjust the steam emission rate of the steam iron 2, the passive module 700 is driven by the active module 800 to synchronously adjust the temperature of the soleplate 32.

[0013] The passive module 700 includes a temperature adjuster 51 for being rotated to adjust the temperature of the soleplate 32, and a transmission arm unit 52 that is disposed in the casing 31 and that is horizontally movable for rotating the temperature adjuster 51. The active module 800 includes a rotary switch 53 that is rotatably mounted to the casing 31 and that is partially exposed from the casing 31 for manual operation, and an adjusting rod unit 54 that is uprightly mounted in the casing 31, that is pivoted to the rotary switch 53, and that is movable relative to the casing 31 for driving movement of the transmission arm unit 52. The adjusting rod unit 54 includes an adjusting rod 55 that is mounted in a front portion of the casing 31 and that is moved relative to the casing 31 by the rotary switch 53 in an upright direction.

[0014] The temperature adjuster 51 has a pinion portion 511 meshing with the transmission arm unit 52, so that movement of the transmission arm unit 52 rotates the temperature adjuster 51 to adjust the temperature of the soleplate 32.

[0015] The transmission arm unit 52 includes a transmission arm 521 that is horizontally movable relative to the casing 31 in a front-rear direction, and two arm resilient members 520 each of which has two opposite ends respectively abutting against the transmission arm 521 and the casing 31 (see Figure 3). The transmission arm 521 has an arm portion 522 that extends in the front-rear direction, a driven portion 523 that is fixedly connected to a front end of the arm portion 522 and that protrudes forwardly, and a rack portion 528 that is connected to a lateral side of a rear end of the arm portion 522, that extends in the front-rear direction, and that meshes with the pinion portion 511 of the temperature adjuster 51. The rack portion 528 is moved by the arm portion 522 in the front-rear direction to rotate the pinion portion 511 of the temperature adjuster 51.

[0016] The transmission arm 521 further has a plurality of guiding grooves 529 each of which is formed through top and bottom surfaces of the transmission arm 521 and extends in the front-rear direction. The casing 31 has a plurality of limiting portions 312 each of which movably engages a respective one of the guiding grooves 529, so that the transmission arm 521 is only permitted to move relative to the casing 31 in the front-rear direction.

[0017] The driven portion 523 of the transmission arm 521 tapers toward the adjusting rod 55, and has an upper driven surface 524 that is inclined downwardly toward the adjusting rod 55, a lower driven surface 524' that is inclined upwardly toward the adjusting rod 55, and a driven tapered end 525 that is located between the upper and lower driven surfaces 524, 524'. Each of the upper driven surface 524, the lower driven surface 524' and the driven tapered end 525 is contact able with the adjusting rod unit 54 . Each of the arm resilient members 520 extends in the front-rear direction, is spaced apart from the other one of the arm resilient members 520 in a left-right direction, and has two opposite ends respectively abutting against the transmission arm 521 and the casing 31 for resiliently biasing the transmission arm 521 to abut against the adjusting rod 55. In this embodiment, each of the arm resilient members 520 is configured as a compression spring. In a variation, each of the arm resilient members 520 may be configured as an elastic rubber, a V-shaped resilient plate, a torsion spring or the like.

[0018] Referring to Figures 5 to 7, the rotary switch 53 is rotatable relative the casing 31. A rotating axis about which the rotary switch 53 is rotatable extends in the front-rear direction, and is orthogonal to a longitudinal axis of the adjusting rod 55. The rotary switch 53 has an oblong engaging groove 530 (see Figure 2) that is located at the left side the rotating axis and that substantially extend in a lateral direction. The engaging groove 530 is engaged with the adjusting rod unit 54 such that rotation of the rotary switch 53 moves the adjusting rod unit 54 relative to the casting 31 in the upright direction. The rotary switch 53 is manually operable to rotate among a right position (a first limit position, see Figure 6) where the rotary switch 53 is rotated rightward to be stopped by the casing 31, a left position (a second limit position, see Figure 7) where the rotary switch 53 is rotated leftward to be stopped by the casing 31, and a middle position (see Figures 4 and 5) that is located between the right and left positions.

[0019] Referring to Figures 3 to 5, the adjusting rod 55 of the adjusting rod unit 54 is moved by the rotary switch 53 in the upright direction, and includes a rod portion 56 that is movably inserted into the inlet hole 331 for adjusting flow rate of the water flowing into the steam chamber 33, a pivot portion 57 that is disposed on a top end of the rod portion 56 and that engages pivotally the rotary switch 53, and a driving portion 58 that protrudes from the rod portion 56 toward the transmission arm 521 and that is substantially triangle-shaped.

[0020] The rod portion 56 of the adjusting rod 55 has a fluid-tight section 561 that is operable to fluid-tightly seal the inlet hole 331, a low flow rate section 562 that extends downwardly from a lower end of the fluid-tight section 561, and a high flow rate section 564 that extends downwardly from a lower end of the low flow rate section 562. The low flow rate section 562 has two low flow rate grooves 563 (only one is visible in Figures 4 and 5) each of which is formed in an outer surrounding surface thereof and extends downwardly. The high flow rate section 564 has two high flow rate grooves 565 (only one is visible in Figures 4 and 5) each of which is formed in an outer surrounding surface thereof, is in fluid communication with a respective one of the low flow rate grooves 563, and extends downwardly through a lower portion of the high flow rate section 564 . Each of the high flow rate grooves 565 has a volume greater than that of each of the low flow rate grooves 563. The adjucting rod 55 is moved by the rotary switch 53 among a high flow rate position where the high flow rate section 564 corresponds in position to the inlet hole 331 so that the water in the water chamber 35 flows into the steam chamber 33 via the high flow rate grooves 565 at a relatively high flow rate, a low flow rate position where the low flow rate section 562 corresponds in position to the inlet hole 331 so that the water in the water chamber 35 flows into the steam chamber 33 via the low flow rate grooves 563 at a relatively low flow rate, and a seal position where the fluid-tight section 561 corresponds in position to and seals the inlet hole 331 so that the water in the water chamber 35 is prevented from flowing into the steam chamber 33.

[0021] Referring to Figures 2, 3 and 4, the pivot portion 57 of the adjusting rod 55 has a pivot rod 571 that is spaced apart from the longitudinal axis of the adjusting rod 55, and that engages pivotally and movably the engaging grove 530 of the rotary switch 53 (see Figure 2) . When the rotary switch 53 is rotated, the pivot rod 571 moves along the engaging groove 530, and is moved by the rotary switch 53 so as to move the rod portion 56 and the driving portion 58 of the adjusting rod 55 in the upright direction. The pivot portion 57 further has three positioning grooves 572 that are formed in a rear surface thereof and that are spaced apart from each other in the upright direction. The main body 3 further includes a positioning resilient plate 34 that is mounted to the casing 31 and that resiliently and removably engages an alternative one of the positioning grooves 572 for positioning the adjusting rood 55 relactive to the casing 31 at a corresponding one of the high flow rate position, the low flow rate position and the seal position.

[0022] The driving portion 58 of the adjusting rod 55 has an upper driving surface 581 that is inclined downwardly toward the transmission arm 521, a lower driving surface 581' that is inclined upwardly toward the transmission arm 521, and a driving tapered end 582 that is located between the upper and lower driving surfaces 581, 581'. The upper and lower driving surfaces 581, 581' of the driving portion 58 are respectively contactable with the lower and upper driven surfaces 524' 524 of the driven portion 523 of the transmission arm 521. The driving tapered end 582 of the driving portion 58 is contactable with the driven tapered end 525 of the driven portion 523 of the transmission arm 521.

[0023] In this embodiment, when the rotary switch 53 is at the right position (see Figure 6), the adjusting rod 55 is at the high flow rate position so that the water flows into the steam chamber 33 at a relatively high flow rate, and the lower driving surface 581' of the driving portion 58 is in contact with the upper driven surface 524 of the driven portion 523 of the transmission arm 521.

[0024] When the rotary switch 53 is rotated from the right position to the middle position (see Figures 4 and 5), the adjusting rod 55 is moved downwardly by the rotary switch 53 from the high flow rate position to the low flow rate position, so that the water flows into the steam chamber 33 at a relatively low flow rate to thereby lower the steam emission rate of the steam iron 2. During the movement of the adjusting rod 55 from the high flow rate position to the low flow rate position, the lower driving surface 581' of the driving portion 58 pushes the upper driven surface 524 of the driven portion 523 of the transmission arm 521 to move the transmission arm 521 rearwardly against the biasing action of the arm resilient members 520, so as to rotate the temperature adjuster 51 until the lower driving surface 581' and the upper driven surface 524 are separated from each other and the driving tapered end 582 is in contact with the driven tapered end 525. In this embodiment, the rearward movement of the transmission arm 521 rotates the temperature adjuster 51 to lower the temperature of the soleplate 32.

[0025] When the rotary switch 53 is rotated from the middle position to the left position (see Figure 7), the adjusting rod 55 is moved downwardly by the rotary switch 53 from the low flow rate position to the seal position, so that the water is prevented from flowing into the steam chamber 33 and that the steam iron 2 would not emit steam. During the movement of the adjusting rod 55 from the low flow rate position to the seal position, the driving tapered end 582 and the driven tapered end 525 are first moved to be separated from each other. Then, in response to further downward movement of the adjusting rod 55, the arm resilient members 520 bias the transmission arm 521 to move forwardly, so that the lower driven surface 524' of the driven portion 523 is pushed against the upper driving surface 581 of the driving portion 58 and that the temperature adjuster 51 is rotated by the transmission arm 521 to raise the temperature of the soleplate 32.

[0026] The steam iron 2 of this disclosure provides high steam emission rate mode, low steam emission rate mode and dry iron mode for different needs. Referring to Figure 6, when the high steam emission rate mode is in demand, the rotary switch 53 is rotated to the right position so that the adjusting rod 55 is moved to the high flow rate position, and the temperature adjuster 51 is thereby rotated by the transmission rod 521 to raise the temperature of the soleplate 32. At this time, the water in the water chamber 35 flows into the steam chamber 33 at a relatively high flow rate to be evaporated by the soleplate 32 that is at relatively high temperature.

[0027] Referring to Figures 4 and 5, when the low steam emission rate mode is in demand, the rotary switch 53 is rotated to the middle position so that the adjusting rod 55 is moved to the low flow rate position, and the temperature adjuster 51 is thereby rotated by the transmission rod 521 to lower the temperature of the soleplate 32. At this time, the water in the water chamber 35 flows into the steam chamber 33 at a relatively low flow rate to be evaporated by the soleplate 32 that is at relatively low temperature.

[0028] Referring to Figures 2, 3 and 7, when the dry iron mode is in demand, the rotary switch 53 is rotated to the left position so that the adjusting rod 55 is moved to the seal position, and the temperature adjuster 51 is thereby rotated by the transmission rod 521 to raise the temperature of the soleplate 32. At this time, the water in the water chamber 35 is prevented from flowing into the steam chamber 33, and the soleplate 32 is at relatively high temperature for dry ironing.

[0029] Referring to Figures 8, 9 and 11, the second embodiment of the steam iron 2 according to the disclosure is different from the first embodiment in the configuration of the synchronous adjustment mechanism 5. For the sake of brevity, only the differences between the first and second embodiments are described in the following paragraphs.

[0030] In the second embodiment, the active module 800 further includes a sleeve member 502 that is connected fixedly to the main body 3 and that permits the rod portion 56 of the adjusting rod 55 to extend therethrough. The sleeve member 502 has an oblong limiting through hole 503 formed in a rear side thereof. The sleeve member 502 further has an upper limiting surface 504 that defines an upper edge of the limiting through hole 503 and that is inclined upwardly toward the adjusting rod 55, and a lower limiting surface 505 that defines a lower edge of the limiting through hole 503 and that is inclined downwardly toward the adjusting rod 55.

[0031] Referring to Figures 9 to 11, the adjusting rod 55 of the second embodiment is formed with an installation groove 567 that faces toward the limiting through hole 503. The adjusting rod unit 54 further includes a driving block 59 that is movably mounted to the installation groove 567 of the adjusting rod 55, and a rod resilient member 501 that has two opposite ends respectively abutting against the driving block 59 and the adjusting rod 55.

[0032] The driving block 59 is movable relative to the adjusting rod 55 in the front-rear direction, and extends rearwardly through the limiting through hole 503. In this embodiment, the driving block 59 is substantially triangle-shaped and tapers rearwardly. A height of the driving block 59 is greater than that of a rear opening of the installation groove 567 so that the driving block 59 is prevented from being separated from the installation groove 567. The driving block 59 has an upper driving surface 591 that is inclined downwardly toward the transmission arm 521, a lower driving surface 591' that is inclined upwardly toward the transmission arm 521, and a driving tapered end 592 that is located between the upper and lower driving surfaces 591, 591'. The upper and lower driving surfaces 591, 591' are respectively contactable with the upper and lower limiting surfaces 504, 505 of the sleeve member 502.

[0033] The driven portion 523 of the transmission arm 521 of this embodiment has an upright driven surface 526 that faces toward the adjusting rod 55 and that is contactable with the driving tapered end 592 of the driving block 59.

[0034] The rod resilient member 501 is disposed in the installation groove 567 of the adjusting rod 55, and resiliently biases the driving block 59 toward the transmission arm 521 away from the adjusting rod 55. In this embodiment, the rod resilient member 501 is configured as a compression spring, and exerts a force greater than that exerted by the arm resilient members 520.

[0035] The rotary switch 53 is rotatable among the right, middle and left positions to adjust the steam emission rate of the second embodiment.

[0036] Referring to Figure 11, when the rotary switch 53 is rotated to the middle position, the adjusting rod is at the low flow rate position, and the driving block 59 protrudes out of the sleeve member 502 by a maximum extent with the upper and lower driving surfaces 591, 591' thereof being respectively in contact with the upper and lower limiting surfaces 504, 505 of the sleeve member 502. Since the rod resilient member 501 exerts a force greater than that exerted by the arm resilient members 520, the driving block 59 pushes the transmission arm 521 against the biasing action of the arm resilient members 520 to rotate the temperature adjuster 51 to lower the temperature of the soleplate 32 (see Figure 8). At this time, the steam iron 2 is in the low steam emission rate mode.

[0037] Referring to Figure 12, when the rotary switch 53 is rotated f rom the middle position to the right position, the adjusting rod 55 is moved upwardly relative to the sleeve member 502 to the high flow rate position. During the movement of the adjusting rod 55 from the low flow rate position to the high flow rate position, the upper limiting surface 504 of the sleeve member 502 pushes the upper driving surface 591 of the driving block 59 to move the driving block 59 away from the transmission arm 521, so that the transmission arm 521 is biased by the arm resilient members 520 to move forwardly to abut against the driving block 59 and that the temperature adjuster 51 is rotated by the transmission arm 521 to raise the temperature of the soleplate 32. At this time, the steam iron 2 is in the high steam emission rate mode.

[0038] Referring to Figure 13, when the rotary switch 53 is rotated from the middle position to the left position, the adjusting rod 55 is moved downwardly relative to the sleeve member 502 to the seal position. During the movement of the adjusting rod 55 from the low flow rate position to the seal position, the lower limiting surface 505 of the sleeve member 502 pushes the lower driving surface 591' of the driving block 59 to move the driving block 59 away from the transmission arm 521, so that the transmission arm 521 is biased by the arm resilient members 520 to move forwardly to abut against the driving block 59 and that the temperature adjuster 51 is rotated by the transmission arm 521 to raise the temperature of the soleplate 32. At this time, the steam iron 2 is in the dry iron mode.

[0039] In summary, by virtue of the synchronous adjustment mechanism 5, when the steam emission rate of the steam iron 2 is adjusted by manual operation of the rotary switch 53, the temperature of the sole plate 32 is adjusted synchronously and accordingly. The operation to switch the steam iron 2 of this disclosure among the different modes is relatively convenient.

[0040] In the description above, for the purposes of explanation, numerous specific details have been set forth in order to provide a thorough understanding of the embodiments. It will be apparent, however, to one skilled in the art, that one or more other embodiments may be practiced without some of these specific details. It should also be appreciated that reference throughout this specification to "one embodiment," "an embodiment," an embodiment with an indication of an ordinal number and so forth means that a particular feature, structure, or characteristic may be included in the practice of the disclosure. It should be further appreciated that in the description, various features are sometimes grouped together in a single embodiment, figure, or description thereof for the purpose of streamlining the disclosure and aiding in the understanding of various inventive aspects.

Claims

1. A synchronous adjustment mechanism (5) adapted for use in a steam iron (2) that includes a soleplate (32), **characterized by**:

an active module (800) operable to adjust steam emission rate of the steam iron (2); and
apassivemodule (700) operable to adjust temperature of the soleplate (32), said active module (800) and said passive module (700) being cooperatively associated with each other, so that when said active module (800) is operated to adjust the steam emission rate of the steam iron (2), said passive module (700) is driven by said active module (800) to synchronously adjust the temperature of the soleplate (32).

2. The synchronous adjustment mechanism (5) as claimed in claim 1, **characterized in that** said active module (800) includes an adjusting rod unit (54) that is movable to adjust the steam emission rate of the steam iron (2), and a switch (53) that is operable to move said adjusting rod unit (54), said passive module (700) including a temperature adjuster (51) that is capable of being driven to adjust the temperature of the soleplate (32), and a transmission arm unit (52) that is capable of being driven by said adjusting rod unit (54) to drive said temperature adjuster (51).

3. The synchronous adjustment mechanism (5) as claimed in claim 2, further **characterized in that** said switch (53) is operable to rotate among different positions so as to move said adjusting rod unit (54) to adjust the steam emission rate of the steam iron (2), the movement of said adjusting rod unit (54) synchronously driving said transmission arm unit (52) to drive said temperature adjuster (51) so as to adjust the temperature of the soleplate (32).

4. The synchronous adjustment mechanism (5) as claimed in claim 3, the steam iron (2) including a main body (3) that has the soleplate (32), said synchronous adjustment mechanism (5) further **characterized in that** said transmission arm unit (52) includes a transmission arm (521) that is adapted to be mounted to the main body (3) and that is movable to drive said temperature adjuster (51), said switch (53) being operable to rotate among a first limit positions, a second limit position, and a middle position that is located between the first and second positions, said adjusting rod unit (54) including an adjusting rod (55) that is pivotally connected to said switch (53) to be driven by the rotation of said switch (53) so as to adjust the steam emission rate of the steam iron (2) and that has a driving portion (58) protruding toward said transmission arm (521), said driving portion (58) being in contact with an upper portion of said transmission arm (521) when said switch (53) is at the first limit position, said driving portion (58) being in contact with a lower portion of said transmission arm (521) when said switch (53) is at the second limit position, said driving portion (58) pushing said transmission arm (521) to drive said temperature adjuster (51) when said switch (53) is rotated toward the middle position from either one of the first and second limit positions.

5. The synchronous adjustment mechanism (5) as claimed in claim 4, further **characterized in that** said transmission arm (521) has a driven portion (523) that is in contact with said driving portion (58) of said adjusting rod (55), said driven portion (523) having an upper driven surface (524) that is inclined downwardly toward said adjusting rod (55), a lower driven surface (524') that is inclined upwardly toward said adjusting rod (55), and a driven tapered end (525) that is located between said upper and lower driven surfaces (524, 524'), said driving portion (58) having an upper driving surface (581) that is inclined downwardly toward said transmission arm (521), a lower driving surface (581') that is inclined upwardly toward said transmission arm (521), and a driving tapered end (582) that is located between said upper and lower driving surfaces (581, 581'), said lower driving surface (581') of said driving portion (58) being in contact with said upper driven surface (524) of said driven portion (523) when said switch (53) is at the first limit position, said upper driving surface (581) of said driving portion (58) being in contact with said lower driven surface (524') of said driven portion (523) when said switch (53) is at the second limit position, when said switch (53) is rotated away from either one of the first and second limit positions to the middle position, a corresponding one of said upper and lower driving surfaces (581, 581') of said driving portion (58) pushing a corresponding one of said upper and lower driven surfaces (524, 524') of said driven portion (523) to move said transmission arm (521) until the corresponding one of said upper and lower driving surfaces (581, 581') and the corresponding one of said upper and lower driven surfaces (524, 524') being separated from each other and said driving tapered end (582) being in contact with said driven tapered end (525).

6. The synchronous adjustment mechanism (5) as claimed in claim 3, further **characterized in that** said transmission arm unit (52) includes a transmission arm (521) that is movable to drive said temperature adjusted (51), said switch (53) being operable to rotate among a first limit position, a second limit position, and a middle position that is located between the first and second limit positions, said adjusting rod unit (54) including an adjusting rod (55) that is moved by the rotation of said switch (53) to adjust the steam emission rate of the steam iron (2), and a driving block (59) and a rod resilient member (501) that are mounted to said adjusting rod (55), said adjusting rod (55) being formed with an installation groove (567), said driving block (59) being limitedly movably mounted to said installation groove (567), and partially extending out of said installation groove (567), said rod resilient member (501) resiliently biasing said driving block (59) away from said adjusting rod (55), said active module (800) further including a sleeve member (502) that permits said adjusting rod (55) to extend therethrough, said sleeve member (502) having a limiting through hole (503) that corresponding in position to said installation groove (567), said driving block (59) being biased by said rod resilient member (501) to extend out of said limiting through hole (503) by a maximum extent and pushing against said transmission rod (521) when said switch (53) is at the middle position, when said switch (53) is rotated away from the middle position to either one of the first and second limit positions, said adjusting rod (55) being moved relative to said sleeve member (502) by said switch (53) such that said sleeve member (502) pushes said driving block (59) to move away from said transmission arm (521) against the biasing action of said rod resilient member (501) so as to permit said transmission rod (521) to move toward said adjusting rod (55) to drive said temperature adjuster (51).

7. The synchronous adjustment mechanism (5) as claimed in claim 6, further **characterized in that** said transmission rod (521) has a driven portion (523), said sleeve member (502) further having an upper limiting surface (504) that defines an upper edge of said limiting through hole (503), and a lower limiting surface (505) that defines a lower edge of said limiting through hole (503), said driving block (59) having an upper driving surface (591) that is inclined downwardly toward said transmission arm (521), and a lower driving surface (591') that is inclined upwardly toward said transmission arm (521), said upper and lower driving surfaces (591, 591') of said driving block (59) being respectively in contact with said upper and lower limiting surfaces (504, 505) of said sleeve member (502) when said switch (53) is at the middle position, said upper limiting surface (504) pushing said upper driving surface (591) to move said driving block (59) away from said transmission arm (521) when said switch (53) is rotated away from the middle position to the first limit position, said lower limiting surface (505) pushing said lower driving surface (591') to move said driving block (59) away from said transmission arm (521) when said switch (53) is rotated away from the middle position to the second limit position.

8. The synchronous adjustment mechanism (5) as claimed in claim 4, further **characterized in that** said transmission arm unit (52) further includes at least one arm resilient member (520) that has two opposite ends respectively abutting against said main body (3) and said transmission arm (521) for resiliently biasing said transmission arm (521) to move toward said adjusting rod (55).

9. The synchronous adjustment mechanism (5) as claimed in claim 8, further **characterized in that** said temperature adjuster (51) has a pinion portion (511), said transmission arm (521) further having a rack portion (528) that meshes with said opinion portion (511) of said temperature adjuster (51).

10. The synchronous adjustment mechanism (5) as claimed in any one of claims 4 and 6, the main body (3) of the steam iron (2) having an inlet hole (331) that fluidly communicates a water chamber (35) and a steam chamber (33), said synchronous adjustment mechanism (5) further **characterized in that** said adjusting rod (55) further having a rod portion (56) that is movably inserted into the inlet hole (331) for adjusting flow rate of the water flowing from the water chamber (35) into the steam chamber (33), said rod portion (56) having a fluid-tight section (561), a low flow rate section (562) that extends downwardly from a lower end of said fluid-tight section (561), and a high flow rate section (564) that extends downwardly from a lower end of said low flow rate section (562), said low flow rate section (562) having at least one low flow rate groove (563) that is formed in an outer surrounding surface thereof, said high flow rate section (564) having at least one high flow rate groove

(565) that is formed in an outer surrounding surface thereof, said high flow rate grooves (565) having a volume greater than that of said low flow rate grooves (563), said adjusting rod (55) being moved by said switch (53) among a high flow rate position where said switch (53) is at the first limit position and where said high flow rate section (564) corresponds in position to said inlet hole (331), a low flow rate position where said switch (53) is at the middle position and where said low flow rate section (562) corresponds in position to said inlet hole (331), and a seal position where said switch (53) is at the second limit position and where said fluid-tight section (561) corresponds in position to and seals said inlet hole (331).

11. A steam iron (2) **characterized by**:

a main body (3) including a soleplate (32); and a synchronous adjustment mechanism (5) disposed on said main body (3), and including

an active module (800) that is operable to adjust steam emission rate of said steam iron (2), and
a passive module (700) that is operable to adjust temperature of said soleplate (32), said active module (800) and said passive module (700) being cooperatively associated with each other, so that when said active module (800) is operated to adjust the steam emission rate of said steam iron (2), said passive module (700) is driven by said active module (800) to synchronously adjust the temperature of said soleplate (32).

12. The steam iron (2) as claimed in claim 11, **characterized in that** said active module (800) includes an adjusting rod unit (54) that is movable to adjust the steam emission rate of said steam iron (2), and a switch (53) that is operable to move said adjusting rod unit (54), said passive module (700) including a temperature adjuster (51) that is capable of being driven to adjust the temperature of said soleplate (32), and a transmission arm unit (52) that is capable of being driven by said adjusting rod unit (54) to drive said temperature adjuster (51).

13. The steam iron (2) as claimed in claim 12, further **characterized in that** said switch (53) is operable to rotate among different positions so as to move said adjusting rod unit (54) to adjust the steam emission rate of said steam iron (2), the movement of said adjusting rod unit (54) synchronously driving said transmission arm unit (52) to drive said temperature adjuster (51) so as to adjust the temperature of said soleplate (32).

14. The steam iron (2) as claimed in claim 13, further **characterized in that** said transmission arm unit (52) includes a transmission arm (521) that is mounted to said main body (3) and that is movable to drive said temperature adjuster (51), said switch (53) being operable to rotate among a first limit position, a second limit position, and a middle position that is located between the first and second limit positions, said adjusting rod unit (54) including an adjusting rod (55) that is pivotally connected to said switch (53) to be driven by the rotation of said switch (53) so as to adjust the steam emission rate of said steam iron (2) and that has a driving portion (58) protruding toward said transmission arm (521), said driving portion (58) being in contact with an upper portion of said transmission arm (521) when said switch (53) is at the first limit position, said driving portion (58) being in contact with a lower portion of said transmission arm (521) when said switch (53) is at the second limit position, said driving portion (58) pushing said transmission arm (521) to drive said temperature adjuster (51) when said switch (53) is rotated toward the middle position from either one of the first and second limit positions.

15. The steam iron (2) as claimed in claim 14, further **characterized in that** said transmission arm (521) has a driven portion (523) that is in contact with said driving portion (58) of said adjusting rod (55), said driven portion (523) having an upper driven surface (524) that is inclined downwardly toward said adjusting rod (55), a lower driven surface (524’) that is inclined upwardly toward said adjusting rod (55), and a driven tapered end (525) that is located between said upper and lower driven surfaces (524, 524’), said driving portion (58) having an upper driving surface (581) that is inclined downwardly toward said transmission arm (521), a lower driving surface (581’) that is inclined upwardly toward said transmission arm (521), and a driving tapered end (582) that is located between said upper and lower driving surfaces (581, 581’), said lower driving surface (581’) of said driving portion (58) being in contact with said upper driven surface (524) of said driven portion (523) when said switch (53) is at the first limit position, said upper driving surface (581) of said driving portion (58) being in contact with said lower driven surface (524’) of said driven portion (523) when said switch (53) is at the second limit position, when said switch (53) is rotated away from either one of the first and second limit positions to the middle position, a corresponding one of said upper and lower driving surfaces (581, 581’) of said driving portion (58) pushing a corresponding one of said upper and lower driven surfaces (524, 524’) of said driven portion (523) to move said transmission arm (521) until the corresponding one of said upper and lower driving surfaces (581, 581’) and the corresponding one of said upper and lower driven surfaces (524, 524’) being separated from each other and said driving tapered end (582) being in contact with said driven tapered end (525).

16. The steam iron (2) as claimed in claim 13, further **characterized in that** said transmission arm unit (52) includes a transmission arm (521) that is movable to drive said temperature adjusted (51), said switch (53) being operable to rotate among a first limit position, a second limit position, and a middle position that is located between the first and second limit positions, said adjusting rod unit (54) including an adjusting rod (55) that is moved by the rotation of said switch (53) to adjust the steam emission rate of said steam iron (2), and a driving block (59) and a rod resilient member (501) that are mounted to said adjusting rod (55), said adjusting rod (55) being formed with an installation groove (567), said driving block (59) being limitedly movably mounted to said installation groove (567), and partially extending out of said installation groove (567), said rod resilient member (501) resiliently biasing said driving block (59) away from said adjusting rod (55), said active module (800) further including a sleeve member (502) that permits said adjusting rod (55) to extend therethrough, said sleeve member (502) having a limiting through hole (503) that corresponding in position to said installation groove (567), said driving block (59) being biased by said rod resilient member (501) to extend out of said limiting through hole (503) by a maximum extent and pushing against said transmission rod (521) when said switch (53) is at the middle position, when said switch (53) is rotated away from the middle position to either one of the first and second limit positions, said adjusting rod (55) being moved relative to said sleeve member (502) by said switch (53) such that said sleeve member (502) pushes said driving block (59) to move away from said transmission arm (521) against the biasing action of said rod resilient member (501) so as to permit said transmission rod (521) to move toward said adjusting rod (55) to drive said temperature adjuster (51).

17. The steam iron (2) as claimed in claim 16, further **characterized in that** said transmission rod (521) has a driven portion (523), said sleeve member (502) further having an upper limiting surface (504) that defines an upper edge of said limiting through hole (503) and that is inclined upwardly toward said adjusting rod (55), and a lower limiting surface (505) that defines a lower edge of said limiting through hole (503) and that is inclined downwardly toward said adjusting rod (55), said driving block (59) having an upper driving surface (591) and a lower driving surface (591'), said upper and lower driving surfaces (591, 591') of said driving block (59) being respectively in contact with said upper and lower limiting surfaces (504, 505) of said sleeve member (502) when said switch (53) is at the middle position, said upper limiting surface (504) pushing said upper driving surface (591) to move said driving block (59) away from said transmission arm (521) when said switch (53) is rotated away from the middle position to the first limit position, said lower limiting surface (505) pushing said lower driving surface (591') to move said driving block (59) away from said transmission arm (521) when said switch (53) is rotated away from the middle position to the second limit position.

18. The steam iron (2) as claimed in claim 14, further **characterized in that** said transmission arm unit (52) further includes at least one arm resilient member (520) that has two opposite ends respectively abutting against said main body (3) and said transmission arm (521) for resiliently biasing said transmission arm (521) to move toward said adjusting rod (55).

19. The steam iron (2) as claimed in claim 18, further **characterized in that** said temperature adjuster (51) has a pinion portion (511), said transmission arm (521) further having a rack portion (528) that meshes with said pinion portion (511) of said temperature adjuster (51).

20. The steam iron (2) as claimed in any one of claims 14 and 16, further **characterized in that** said main body (3) of said steam iron (2) has an inlet hole (331) that fluidly communicates a water chamber (35) and a steam chamber (33), said adjusting rod (55) further having a rod portion (56) that is movably inserted into said inlet hole (331) for adjusting flow rate of the water flowing from said water chamber (35) into said steam chamber (33), said rod portion (56) having a fluid-tight section (561), a low flow rate section (562) that extends downwardly from a lower end of said fluid-tight section (561), and a high flow rate section (564) that extends downwardly from a lower end of said low flow rate section (562), said low flow rate section (562) having at least one low flow rate groove (563) that is formed in an outer surrounding surface thereof, said high flow rate section (564) having at least one high flow rate groove (565) that is formed in an outer surrounding surface thereof, said high flow rate grooves (565) having a volume greater than that of said low flow rate grooves (563), said adjusting rod (55) being moved by said switch (53) among a high flow rate position where said switch (53) is at the first limit position and where said high flow rate section (564) corresponds in position to said inlet hole (331), a low flow rate position where said switch (53) is at the middle position and where said low flow rate section (562) corresponds in position to said inlet hole (331), and a seal position where said switch

(53) is at the second limit position and where said fluid-tight section (561) corresponds in position to and seals said inlet hole (331).

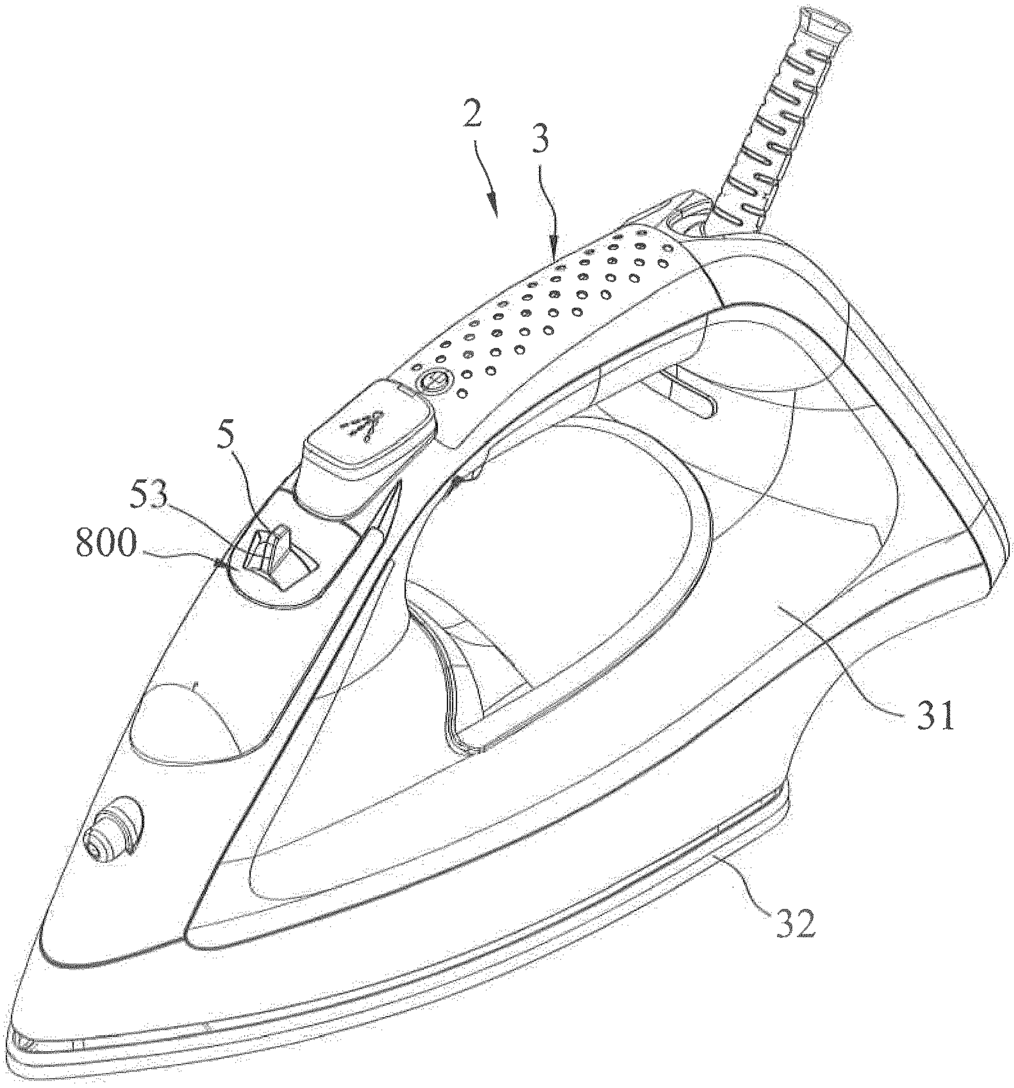

FIG.1

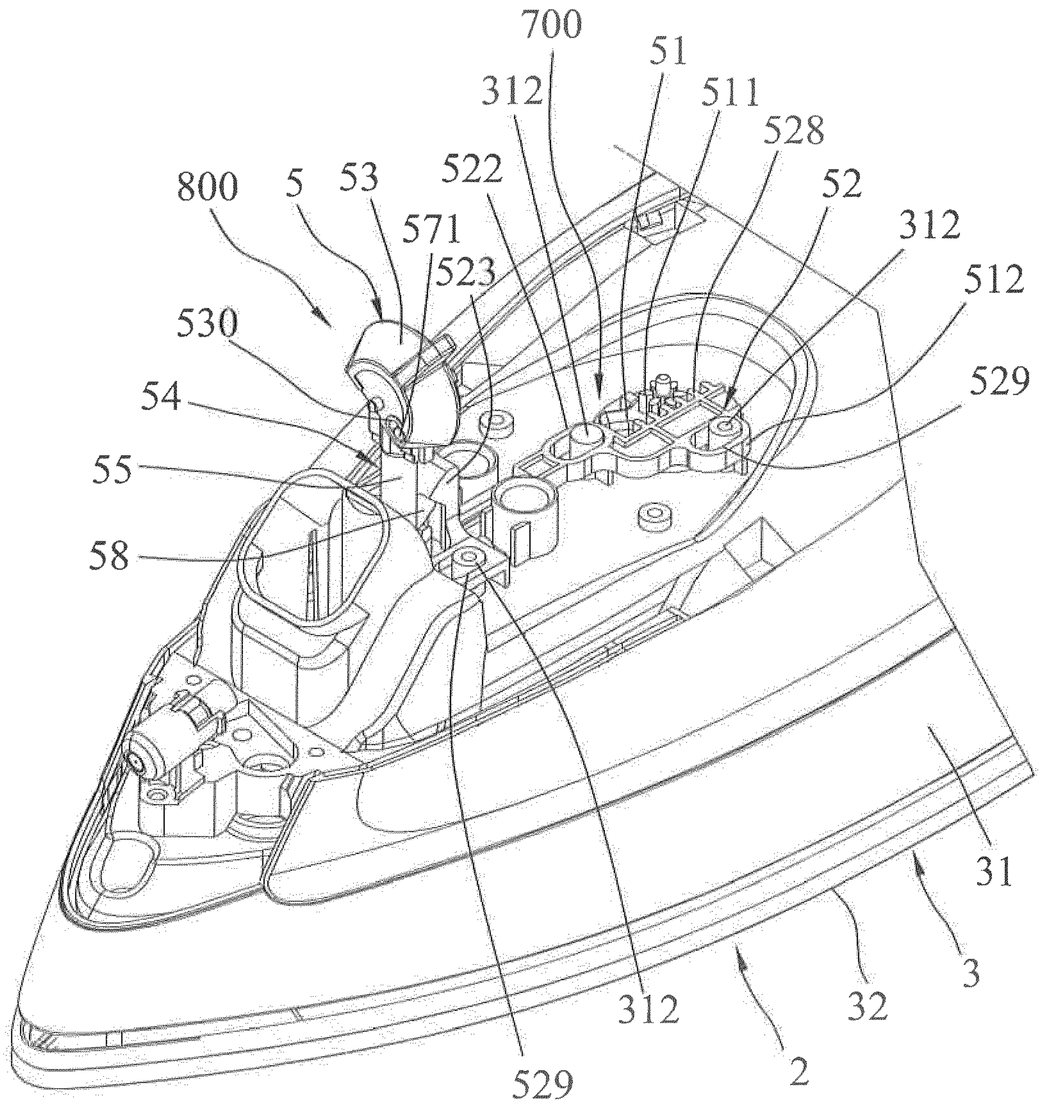
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FIG.2

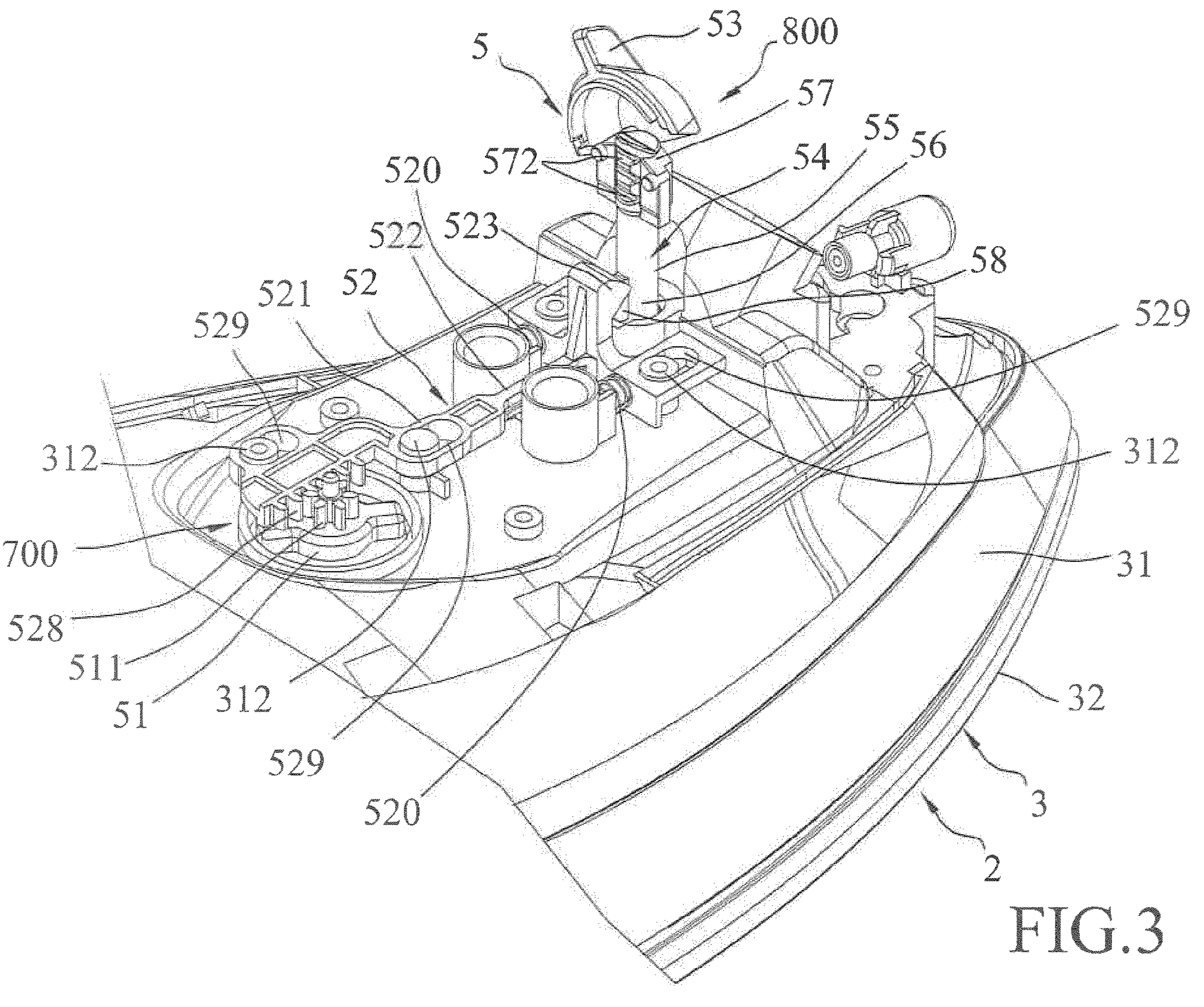
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FIG.3

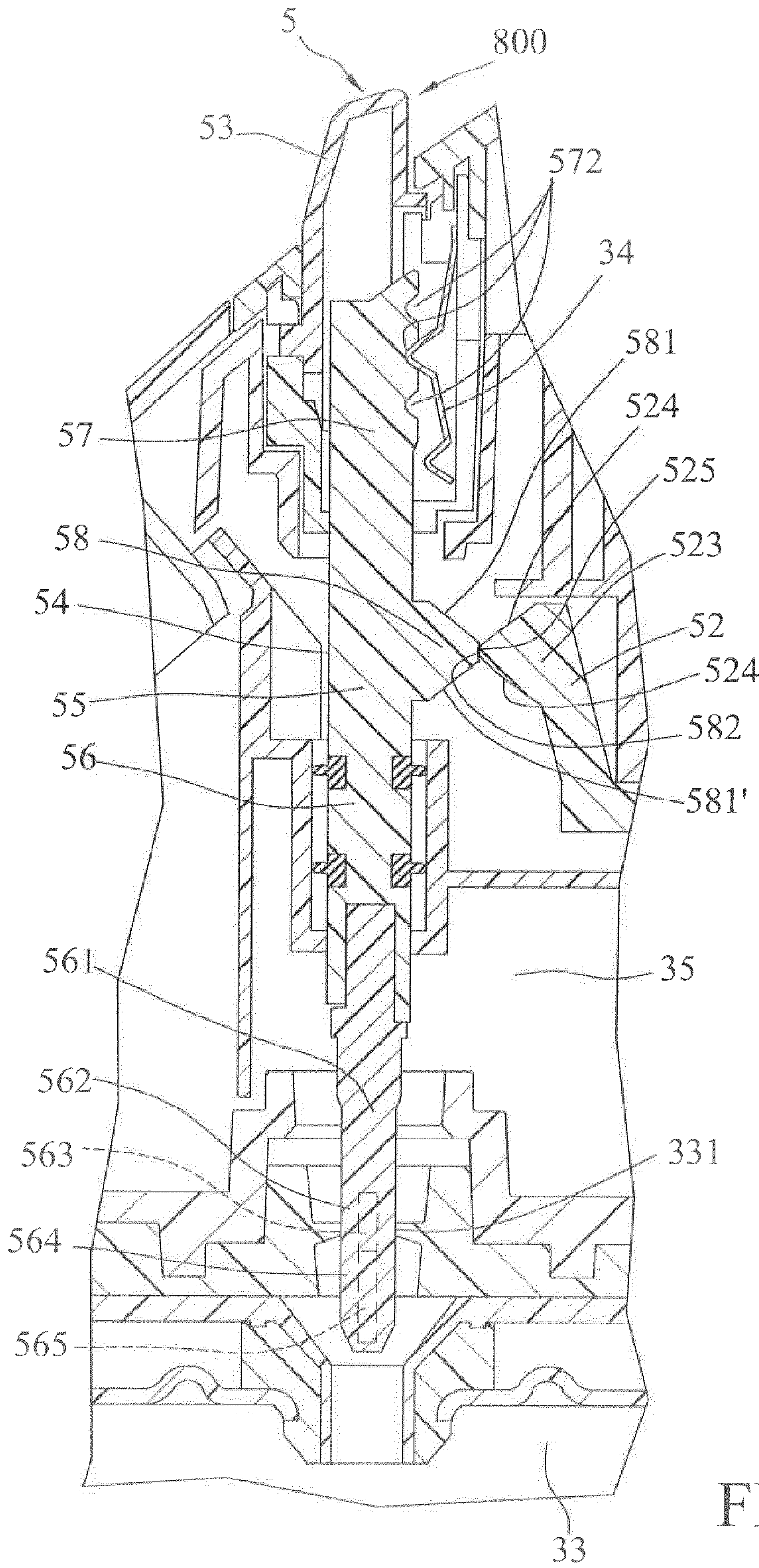
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FIG.4

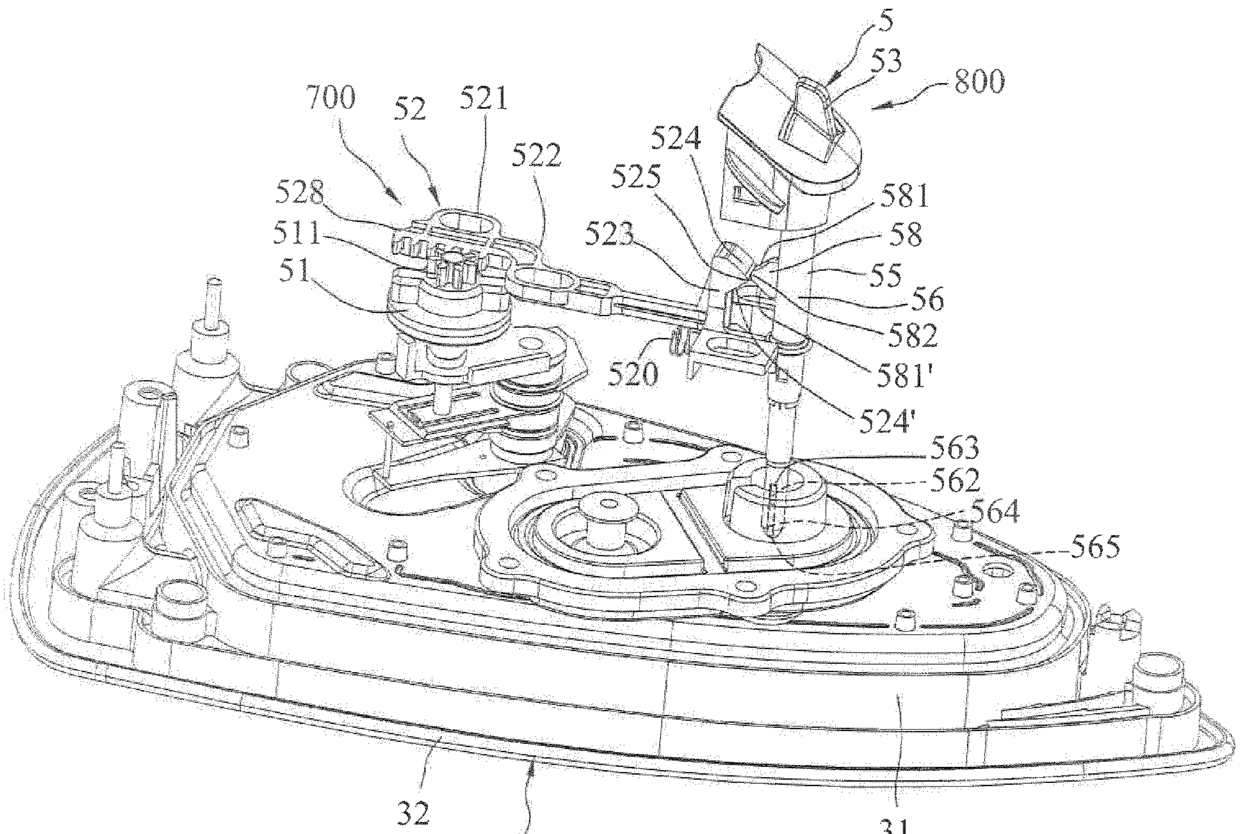
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FIG.5

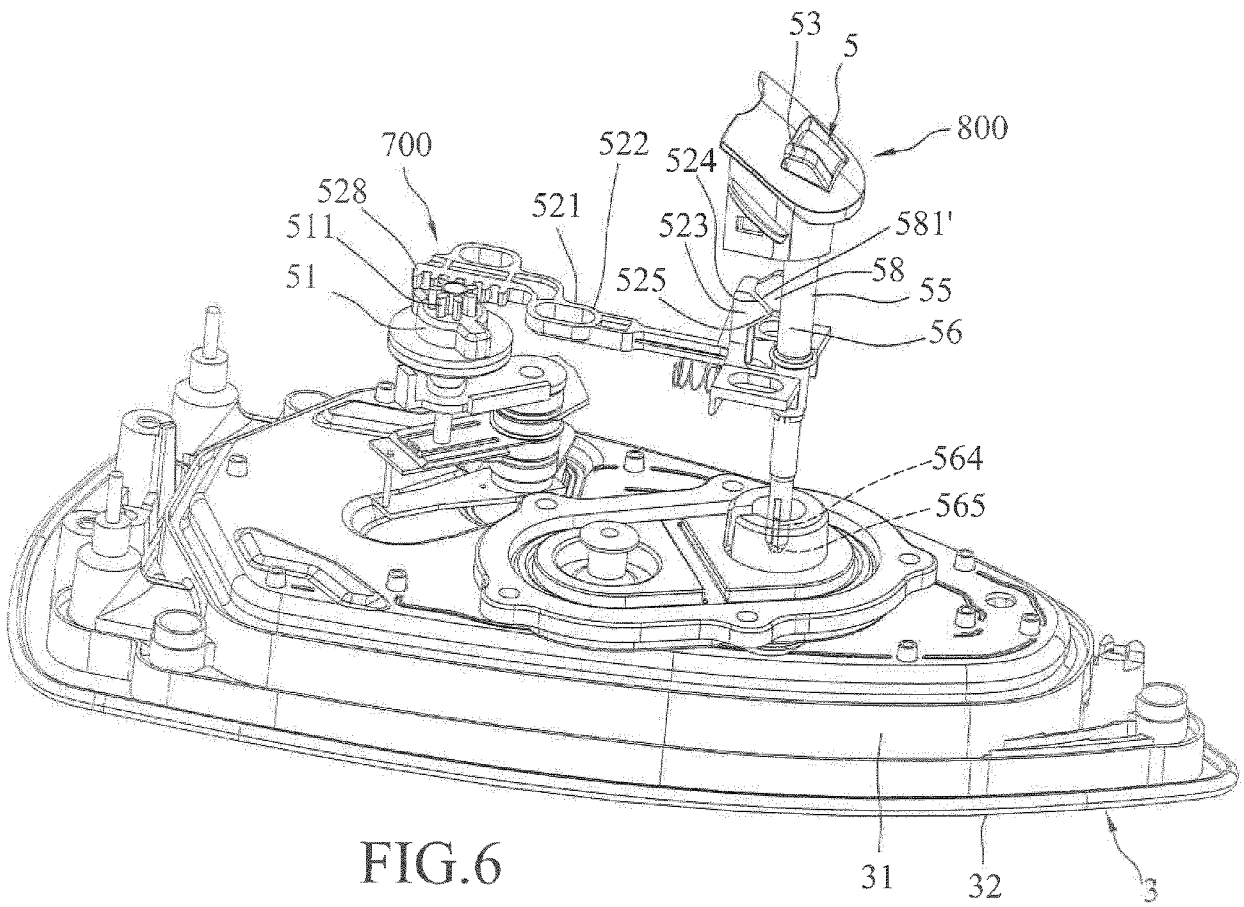
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FIG.6

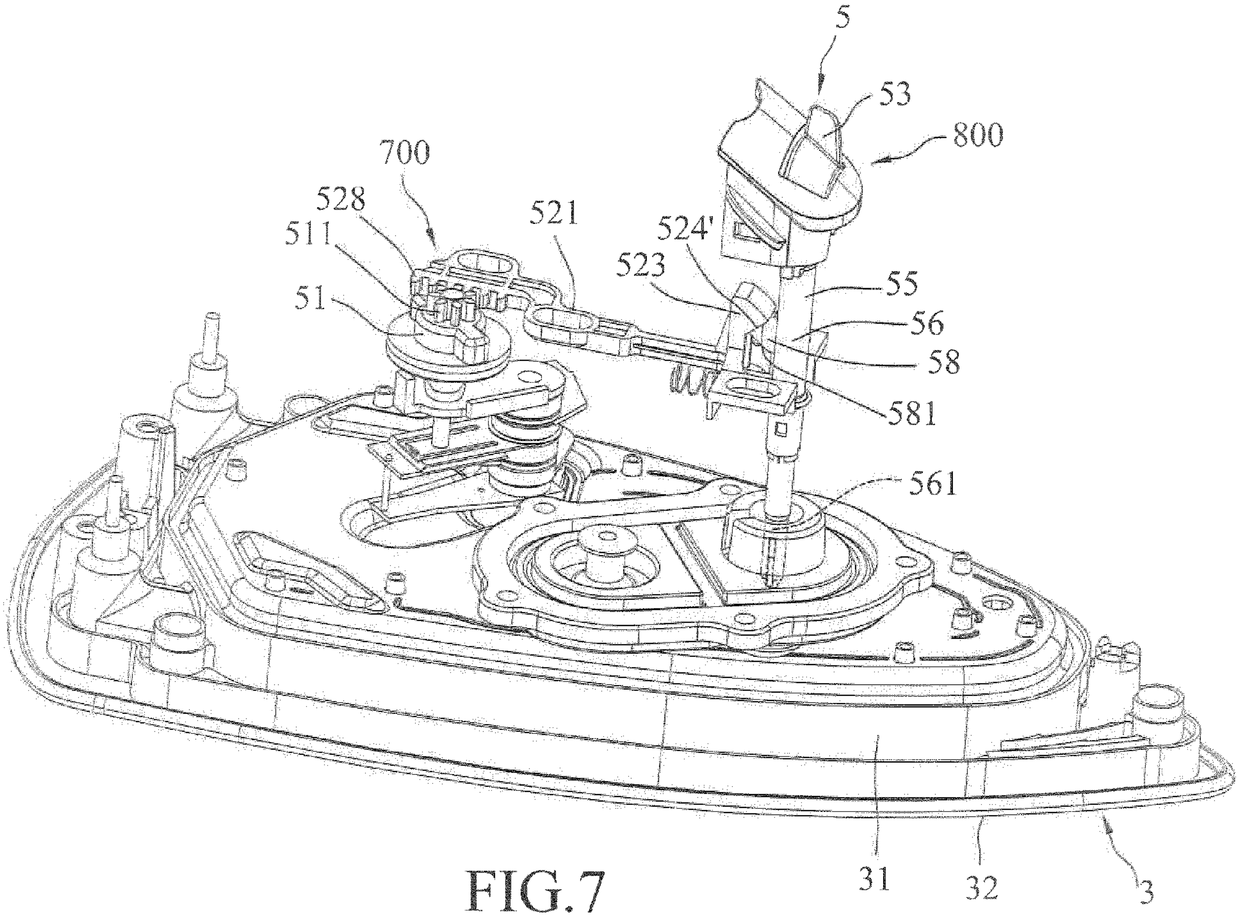

FIG.7

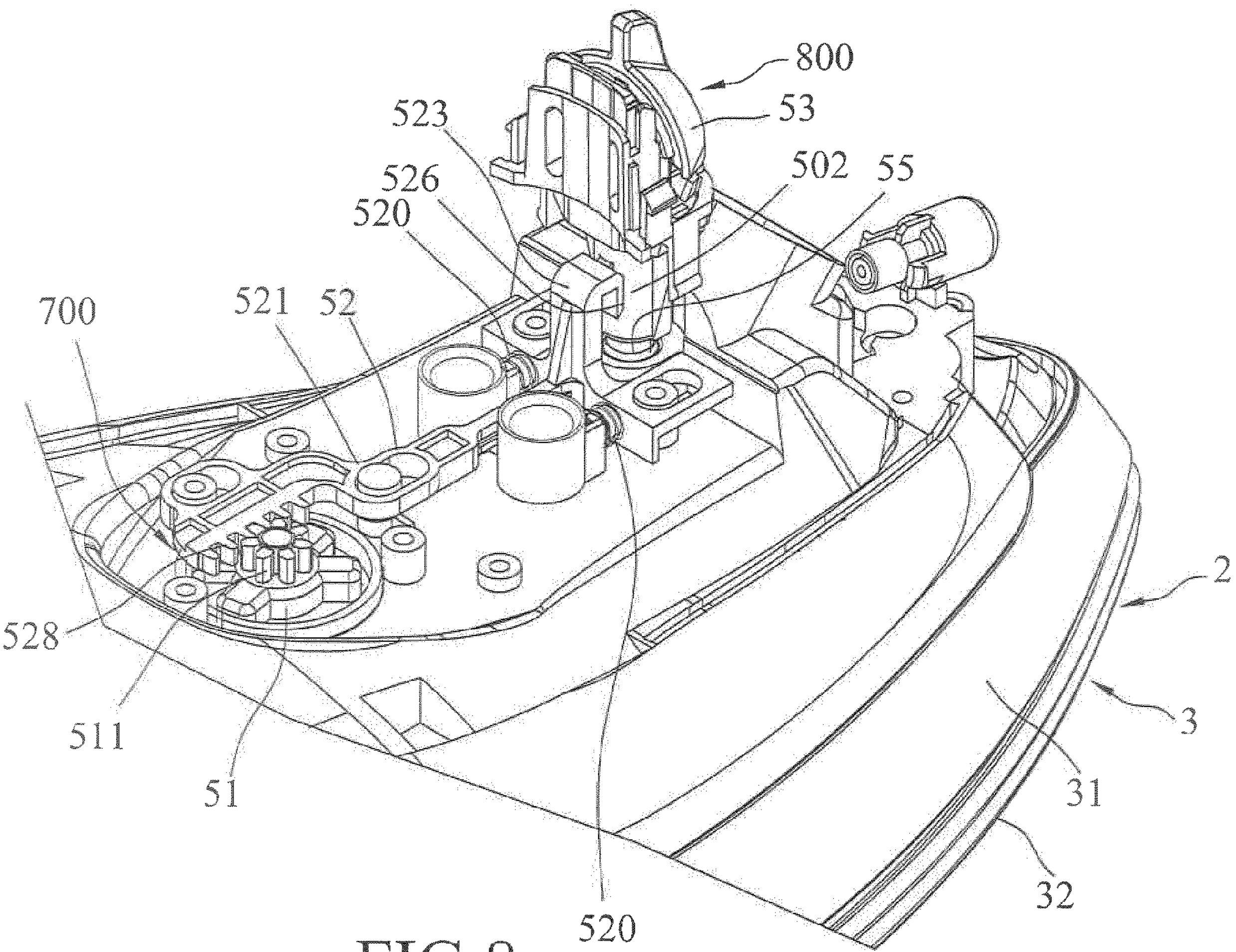

FIG.8

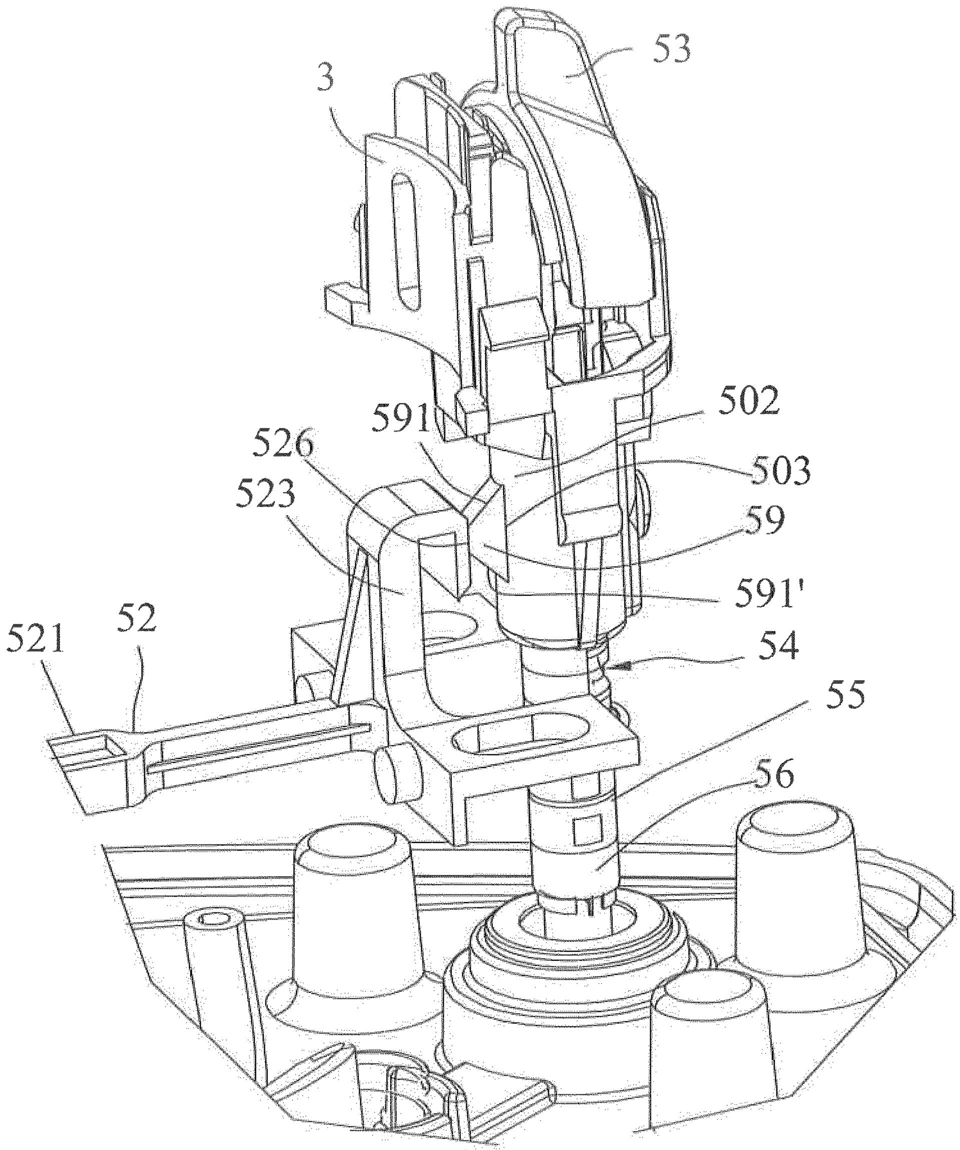

FIG.9

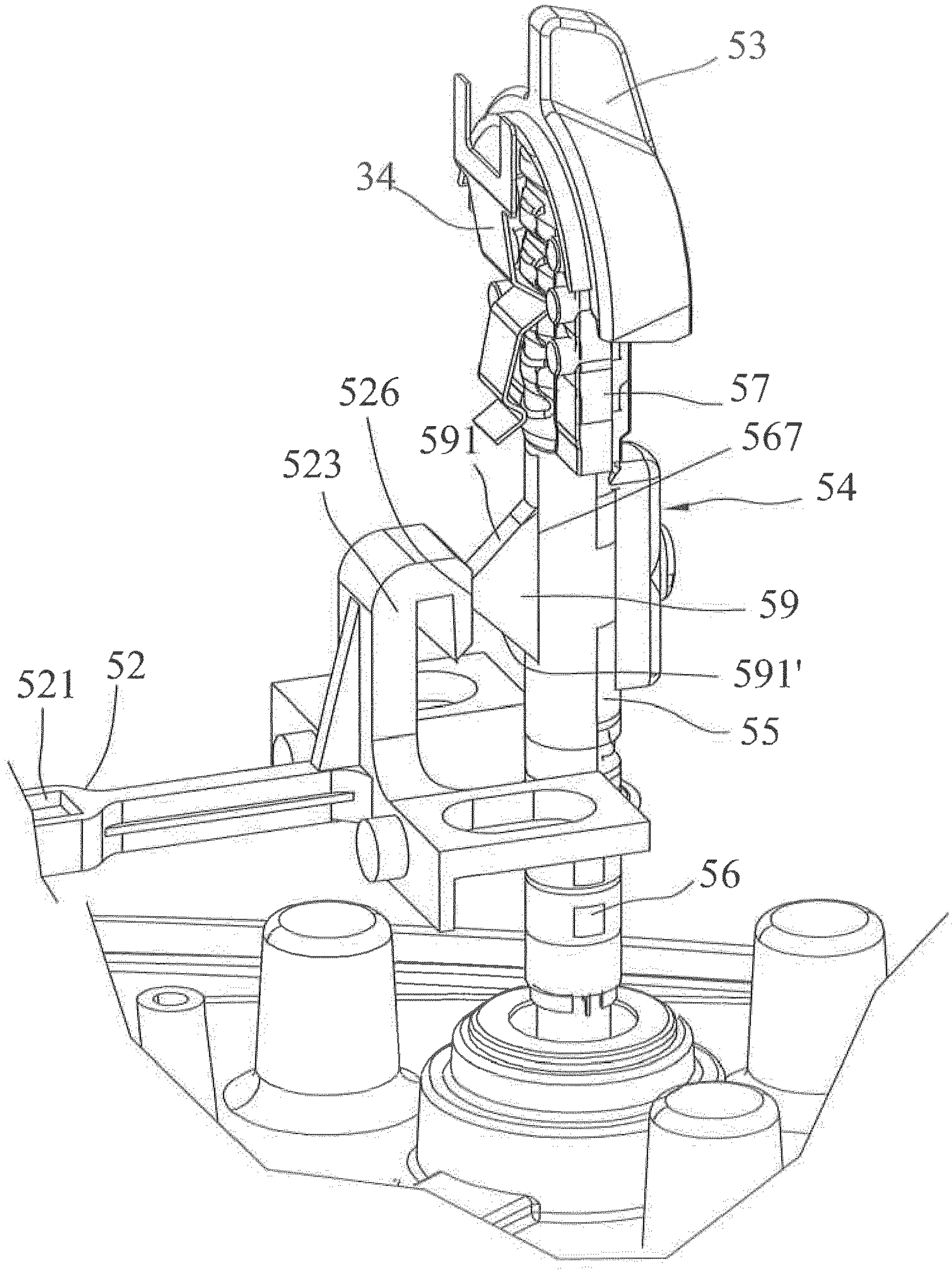

FIG.10

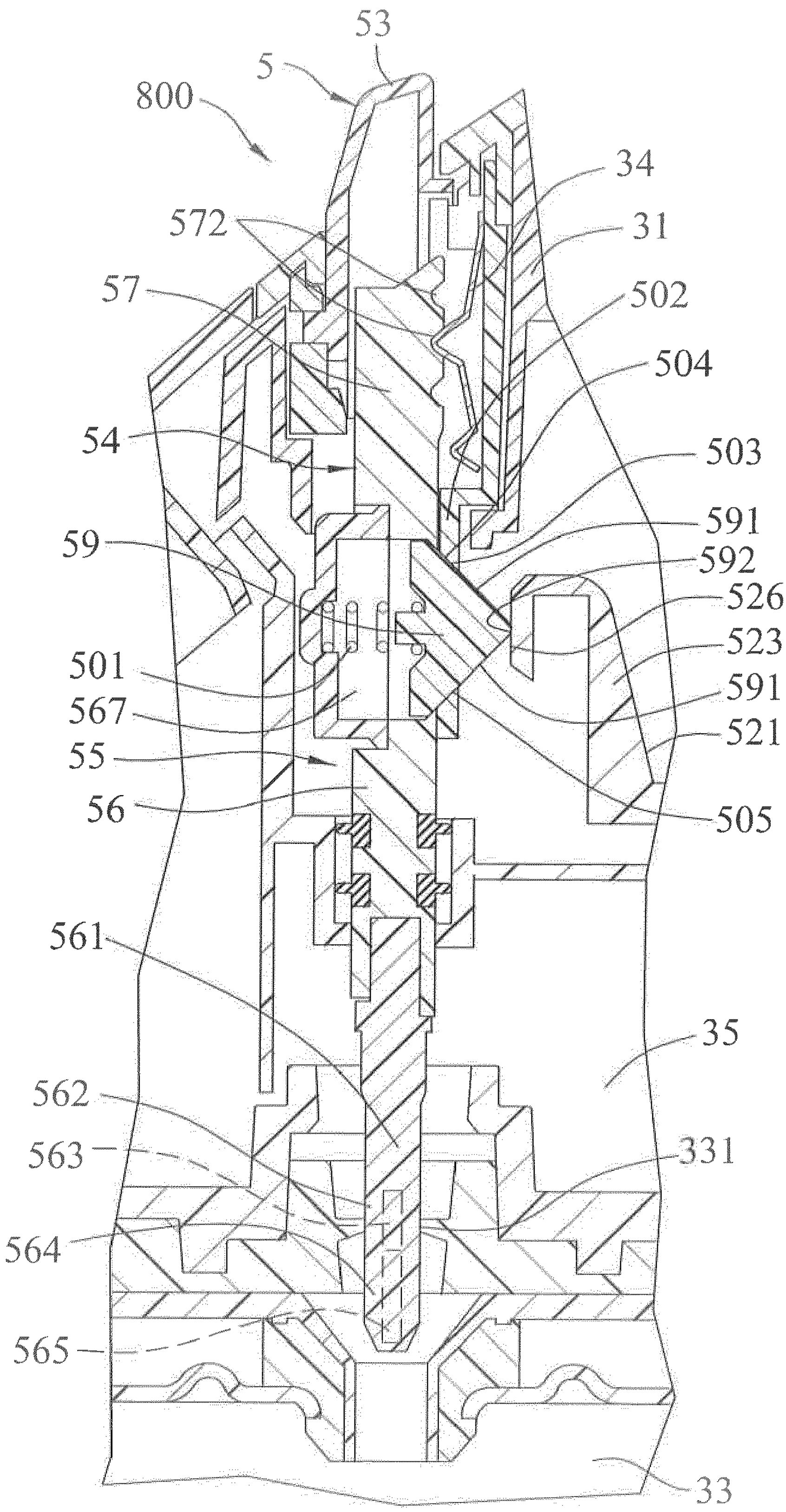
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FIG.11

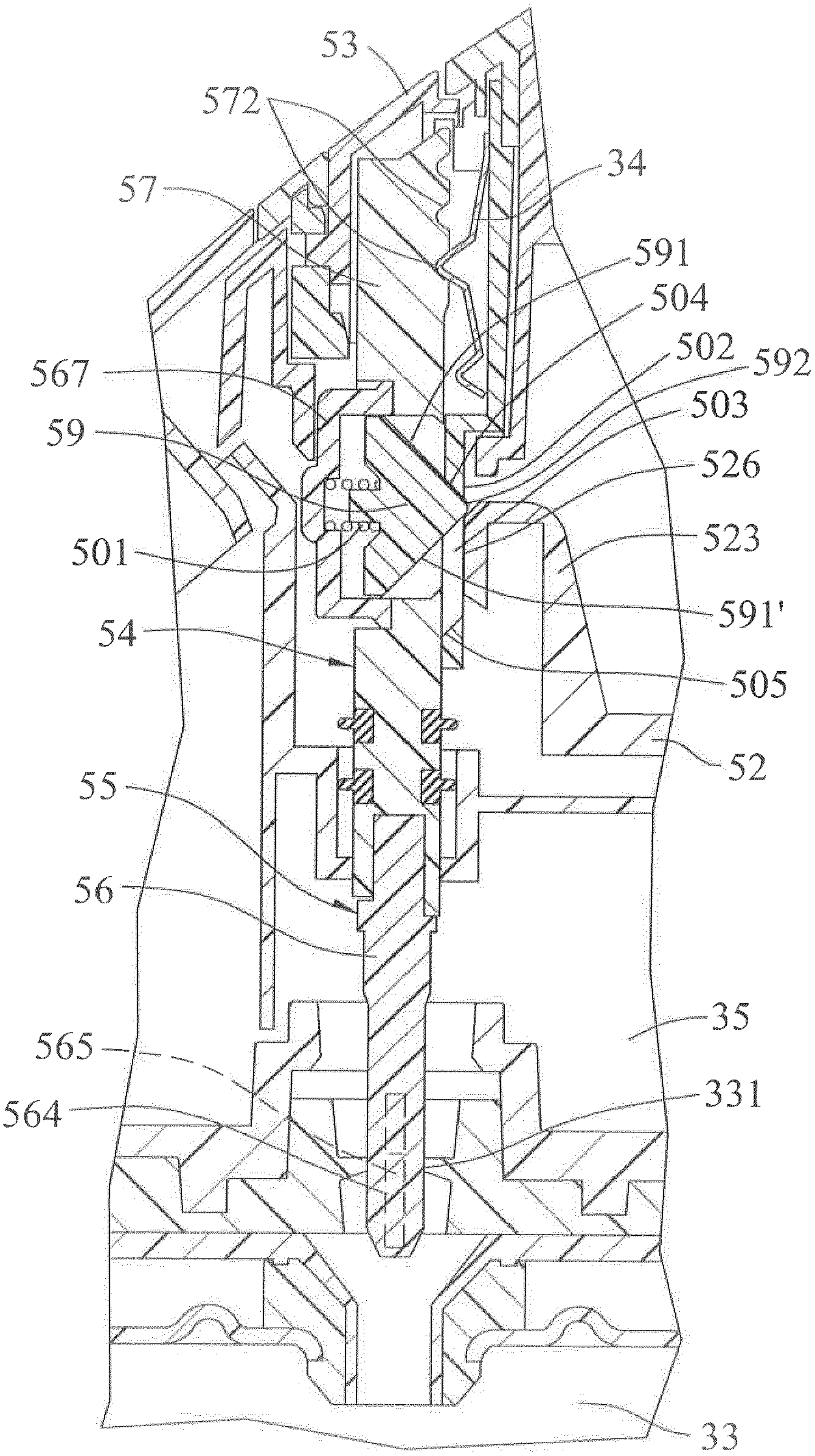
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FIG.12

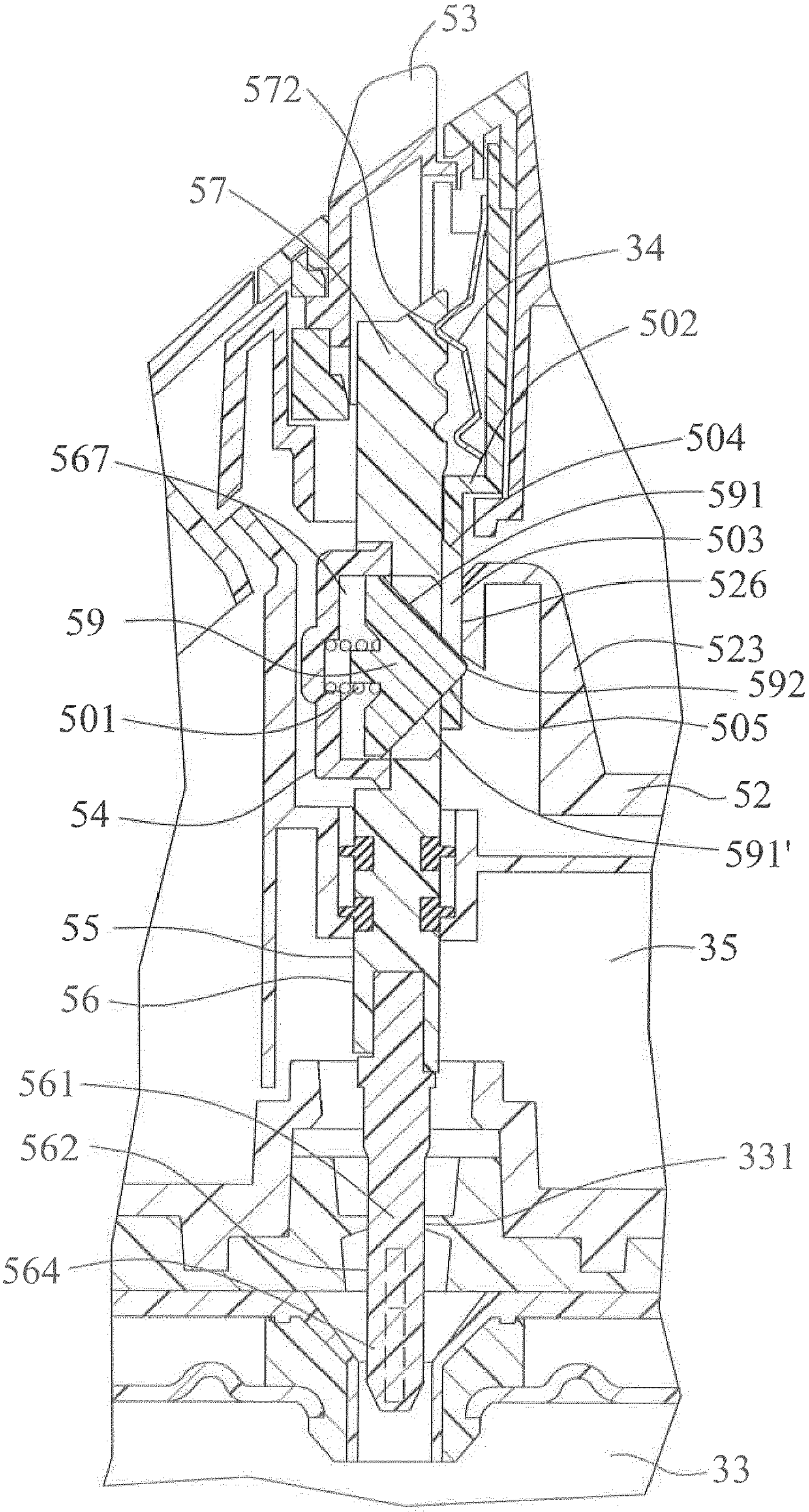
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FIG.13

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EUROPEAN SEARCH REPORT

Application Number
EP 17 15 3725

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 721 804 A (HOOVER LTD) 12 January 1955 (1955-01-12) * page 1, line 75 - page 3, line 29; figures * -----	1,11	INV. D06F75/18
A	EP 2 705 190 A1 (SEB SA [FR]) 12 March 2014 (2014-03-12) * the whole document * -----	1-20	
A	WO 2009/083417 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]; DUSCHEK HORST JUERGEN [ES]) 9 July 2009 (2009-07-09) * the whole document * -----	1-20	

TECHNICAL FIELDS SEARCHED (IPC)

D06F

The present search report has been drawn up for all claims

2

Place of search	Date of completion of the search	Examiner
Munich	3 July 2017	Diaz y Diaz-Caneja

CATEGORY OF CITED DOCUMENTS

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03-07-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 721804 A	12-01-1955	DE 1039471 B	25-09-1958
		GB 721804 A	12-01-1955
		US 2710469 A	14-06-1955
EP 2705190 A1	12-03-2014	CN 103492630 A	01-01-2014
		EP 2705190 A1	12-03-2014
		FR 2974822 A1	09-11-2012
		JP 6091491 B2	08-03-2017
		JP 2014512928 A	29-05-2014
		WO 2012153038 A1	15-11-2012
WO 2009083417 A1	09-07-2009	DE 102007062879 A1	09-07-2009
		WO 2009083417 A1	09-07-2009

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