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(54) **Power tool with fastener guide member**

(57) A screwdriver (1) includes a guide member (2) for guiding a screw strip (7) that carries a plurality of screws (7b) arranged at intervals along a length of the screw strip (7). A feeding device (6) feeds the screw strip (7) such that the screws (7b) of the screw strip (7) are positioned one after another to oppose to a position for driving by a driver bit (5g). The guide member (2) defines

an arc-shaped guide path having a length, so that the screw strip (7) can move along the guide path. The guide member (2) is configured such that the length of the guide path can be varied at least between a first length and a second length that is longer than the first length. The present invention may also be applied to power tools for driving nails and rivets.

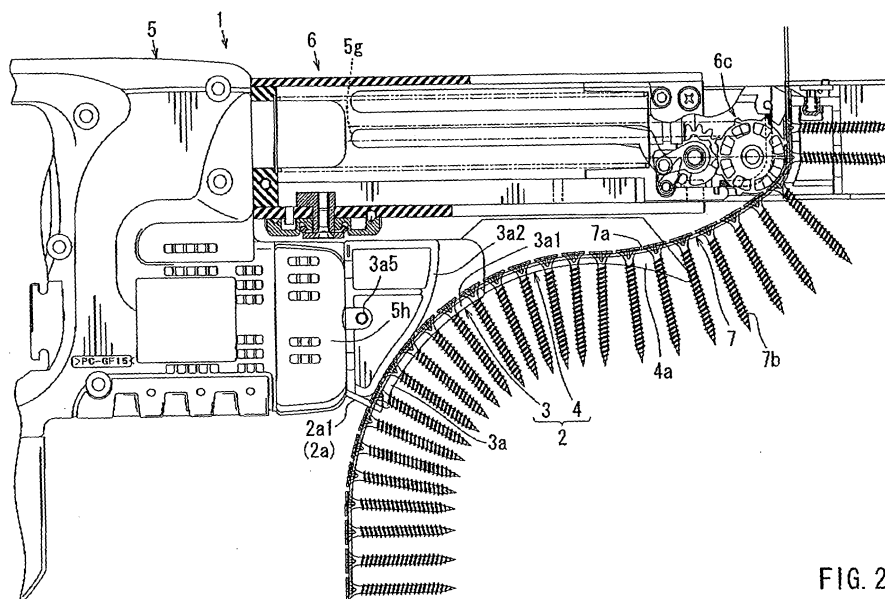


FIG. 2

Description

[0001] This application claims priority to Japanese patent application serial number 2006-302560, the contents of which are incorporated herein by reference.

[0002] The present invention relates to screwdrivers for driving screws carried on a carrier. In this specification, a carrier having screws carried thereon will be hereinafter called "a screw strip."

[0003] Japanese Laid-Open Patent Publication Nos. 5-104456 and 8-155847 teach known screwdrivers. The screwdriver disclosed in Publication No. 5-104456 has a feeding device for feeding screws carried on a screw strip toward a driver bit, and an arc-shaped guide member positioned on the upstream side of the feeding device for guiding the screw strip. However, in order to guide a screw strip carrying long screws, it is necessary to increase the curvature of the guide member. Therefore, the size of the guide member is necessary to be increased.

[0004] The screwdriver disclosed in Publication No. 8-155847 has an arc-shaped guide member in a twisted form, so that a screw strip carrying long screws can be smoothly guided without substantial increase of the curvature. However, the same guide member is used also for a screw strip carrying short screws, even through the length along the arc of the arc-shaped guide is too long for the screw strip carrying short screws. Therefore, it is preferable that the length of the arc-shaped guide is short for the screw strip carrying short screws and is long for the screw strip carrying long screws. It is also preferable that the length of the arc-shaped guide is short for the purpose of storage or for the use within a narrow working space.

[0005] Therefore, there has been a need for a guide member that can change the length of a guide path for a screw strip. There has been also a need for a guide device or a screwdriver having such a guide member.

[0006] According one aspect of the present invention, a screwdriver include a guide member for guiding a screw strip that carries a plurality of screws arranged at predetermined intervals along a length of the screw strip. The screwdriver also includes a feeding device for feeding the screw strip such that the screws of the screw strip are positioned one after another to a position for driving by a driver bit. The guide member defines an arc-shaped guide path having a length, so that the screw strip can move along the guide path. The guide member is configured such that the length of the guide path can be varied at least between a first length and a second length that is longer than the first length.

[0007] Therefore, the length of the guide path can be varied depending on needs. For example, if a screw strip carrying short screws is used, it is possible to provide a short guide path. On the other hand, if a screw carrying long screws is used, it is possible to provide a long guide path. In addition, a short guide path is advantageous when the screwdriver is stored or when a working space

is narrow. As a result, it is possible to improve the operability of the screwdriver.

[0008] In one embodiment, the guide member has a first portion and a second portion. The first portion defines the first length of the guide path and is attached to the side of a tool body of the screwdriver. The second portion is pivotally connected to the first portion and can be moved between an operative position and a storage position. When the second portion is in the operative position, the first portion and the second portion together define the second length of the guide path. With this arrangement, it is possible to change the length of the guide path by simply pivoting the second portion relative to the first portion.

[0009] The second portion may includes a first half and a second half. The first half is configured to cover a first side edge of the screw strip from the outer side. The second half is configured to cover a second side edge opposite to the first side edge of the screw strip from the outer side. The first half and the second half are pivotally connected to the first portion independently of each other. With this arrangement, it is possible to pivot the second portion while the first portion can serve to guide the screw strip. Therefore, the length of the guide path can be changed without removing the screw strip from the first portion.

[0010] In another embodiment, the second portion is removably attached to the first portion for defining the second length of the guide path together with the first portion. Therefore, it is possible to change the length of the guide path by simply attaching and removing the second portion.

[0011] The second portion may include a first half and a second half. The first half is configured to cover a first side edge of the screw strip from the outer side. The second half is configured to cover a second side edge opposite to the first side edge of the screw strip from the outer side. The first half and the second half are respectively removably attached to the first portion independently of each other. With this arrangement, the length of the guide path can be changed without removing the screw strip from the first portion.

[0012] In a further embodiment, the second portion is slidably mounted to the first portion and can slide between an operative position and a storage position on the side of the first portion. When the second portion is in the operative position, the second portion defines the second length of the guide path together with the first portion. With this arrangement, it is possible to change the length of the guide path by slidably moving the second portion toward or away from the first portion.

[0013] In another aspect of the present invention, a fastener guide device for a power tool is provided. The fastener guide device is operable to guide a fastener strip carrying a plurality of fasteners arranged at intervals along a lengthwise direction. For example, the fasteners may be screws, nails, or rivets. The fastener guide device includes a guide member defining a guide path for the

fastener strip. The guide member is configured such that the length of the guide path can be varied. Therefore, it is possible to change the length of the guide path depending on needs.

[0014] In one embodiment, the guide member includes a first portion and a second portion. The first portion defines a first part of the guide path. The second portion defines a second part of the guide path. The second part extends in series with the first part.

[0015] The first portion and the second portion may be pivotally connected to each other or removably attached to each other. Otherwise, the first portion and the second portion may be slidably movable relative to each other.

[0016] Additional objects, features, and advantages, of the present invention will be readily understood after reading the following detailed description together with the claims and the accompanying drawings, in which:

FIG. 1 is a right side view, with a part broken-away, of a screwdriver according to a first embodiment of the present invention;

FIG. 2 is an enlarged view of a primary part of FIG. 1 but showing an extension portion of a guide member in a storage position;

FIG. 3 is a front view of the screwdriver;

FIG. 4 is a front view similar to FIG. 3 but showing the extension portion in the storage position;

FIG. 5 is an enlarged right side view of a portion of a screwdriver according to a second embodiment of the present invention;

FIG. 6 is an enlarged right side view of a portion of the screwdriver shown in FIG. 5 but showing an extension portion of a guide member positioned at a storage position;

FIG. 7 is a front view of the screwdriver shown in FIG. 5;

FIG. 8 is a right side view of the guide member;

FIG. 9 is an enlarged right side view of a portion of a screwdriver according to a third embodiment of the present invention;

FIG. 10 is an enlarged right side view similar to FIG. 9 but showing the state where an extension portion of a guide member has been removed;

FIG. 11 is a right side view of the guide member;

FIG. 12 is an enlarged right side view, with a part broken-away, of a portion of a screwdriver according to a fourth embodiment of the present invention;

FIG. 13 is an enlarged right side view similar to FIG. 12 but showing the state where an extension portion of a guide member has been moved to a storage position; and

FIG. 14 is a front view of the screwdriver shown in FIG. 12.

[0017] Each of the additional features and teachings disclosed above and below may be utilized separately or in conjunction with other features and teachings to provide improved guide devices and screwdrivers having

such guide devices. Representative examples of the present invention, which utilize many of these additional features and teachings both separately and in conjunction with one another, will now be described in detail with reference to the attached drawings. This detailed description is merely intended to teach a person of skill in the art further details for practicing preferred aspects of the present teachings and is not intended to limit the scope of the invention. Only the claims define the scope of the claimed invention. Therefore, combinations of features and steps disclosed in the following detailed description may not be necessary to practice the invention in the broadest sense, and are instead taught merely to particularly describe representative examples of the invention. Moreover, various features of the representative examples and the dependent claims may be combined in ways that are not specifically enumerated in order to provide additional useful embodiments of the present teachings.

(FIRST EMBODIMENT)

[0018] A first embodiment of the present invention will now be described with reference to FIGS. 1 to 4. As shown in FIG 1, a screwdriver 1 of this embodiment generally includes a tool body 5, a guide member 2 and a feeding device 6 for feeding a screw strip 7 to a position opposing to a driver bit 5g.

[0019] As shown in FIG 1, the tool body 5 has a substantially D-shaped housing 5a that includes a grip portion 5b configured to be grasped by an operator. A trigger 5c is mounted to the grip portion 5b and can move into and out of the grip portion 5b. A battery 5d, a drive motor 5e and a power transmission mechanism 5f are disposed within the housing 5a. Pressing the trigger 5c into the grip portion 5b supplies a power from the battery 5d to the drive motor 5e, so that the motor 5e is driven. The driving force of the motor 5e is transmitted to the driver bit 5g via the power transmission mechanism 5f. The power transmission mechanism 5f may include a reduction gear train. The driver bit 5g extends forwardly (rightward as viewed in FIG. 1) from the front end (right end as viewed in FIG. 1) of the housing 5a.

[0020] Referring to FIG. 1, the screw strip 7 includes a carrier 7a and a plurality of screws 7b held by the carrier 7a and positioned at regular intervals along a lengthwise direction of the carrier 7a. In this embodiment, the carrier 7a is made of resin strip. However, wires or any other material can be used as the carrier 7a. The feeding device 6 serves to feed the screw strip 7 such that the screws 7b are positioned to oppose to the driver bit 5g one after another in response to the driving operations of the screws 7b. The feeding device 6 includes a base casing 6a, a feeder casing 6b and a feeder 6c.

[0021] As shown in FIG. 1, the base casing 6a is attached to the front end of the tool body 5, so that the driver bit 5g is covered by the base casing 6a. The feeder casing 6b is movably attached to the front portion, so that

the feeder casing 6b can move in forward and rearward directions (right and left directions as viewed in FIG. 1). A compression coil spring 6d is disposed within the base casing 6a and biases the feeder casing 6b in the forward direction. In order to drive screws 7b, the front portion of the feeder casing 6b is pressed against a workpiece (not shown), so that the feeder casing 6b moves into the base casing 6a against the biasing force of the compression coil spring 6d.

[0022] The feeder 6c serves to feed the screw strip 7 into the base casing 6a and includes a ratchet wheel 6c1, an intermediate gear 6c2 and an arm 6c3. The ratchet wheel 6c1 has a central shaft portion that is rotatably attached to the feeder casing 6b. A plurality of feeding teeth are formed on the outer circumference of the ratchet wheel 6c1 and are engageable with the carrier 7a. The intermediate gear 6c2 has a central shaft that is rotatably attached to the feeder casing 6b. Gear teeth are formed on the outer circumference of the intermediate gear 6c2 and are in engagement with corresponding gear teeth formed on the ratchet wheel 6c1.

[0023] As shown in FIG. 1, the arm 6c3 is pivotally attached to the central shaft of the intermediate gear 6c2 and can pivot within a predetermined angular range about the central shaft. A one-way clutch (not shown) is provided between the arm 6c3 and the intermediate gear 6c2, so that the intermediate gear 6c2 rotates in response to the pivotal movement of the arm 6c2 in one direction. A roller pin 6c4 is mounted to one end of the arm 6c2 away from the pivotal axis and extends into an elongated hole 6c5 formed in the base casing 6a. Therefore, as the feeder casing 6b moves into the base casing 6a for the screw driving operation, the roller pin 6c4 moves along the elongated hole 6c5, so that the arm 6c3 pivots about its axis. As the arm 6c4 pivots, the intermediate gear 6c2 rotates to cause one revolution of the ratchet wheel 6c1. As the ratchet wheel 6c1 makes one revolution, the screw strip 7 is forced to move by a distance of one pitch between two adjacent screws 7b.

[0024] As shown in FIG. 2, the guide member 2 defines an arc-shaped concave guide path, along which the screw strip 7 is guided. As shown in FIGS. 1 and 2, the guide member 2 includes a base portion (or a first portion) 3 and an extension portion (or a second portion) 4. The extension portion 44 is joined to the front end of the base portion 3 and can be folded on the base portion 3 as will be explained later. Therefore, the length of the guide path can be changed between a first length shown in FIG. 2 and a second length shown in FIG. 1.

[0025] As shown in FIG. 3, the base portion 3 is divided into two base halves 3a and 3b in right and left directions. As shown in FIGS. 2 to 4, guide portions 3a1 and 3a2 defining a right side path part are formed on the inner side of the base half 3a. Guide portions 3b1 and 3b2 defining a left side path part are formed on the inner side of the base half 3b. The right and left side path parts extend in parallel to each other and together form a substantially arc shaped first guide path. A mount portion

3a5 for mounting to a mount 5h of the tool body 5 is formed on the outer peripheral side of the base half 3a. Similarly, a mount portion 3b5 for mounting to the mount 5h is formed on the outer peripheral side of the base half 3b.

[0026] The extension portion 4 is divided into two extension halves 4a and 4b in right and left directions. As shown in FIGS. 2 to 4, guide portions 4a1 and 4a2 defining a right side path part are formed on the inner side of the extension half 4a. Guide portions 4b1 and 4b2 defining a left side path part are formed on the inner side of the extension half 3b. The right and left side path parts extend in parallel to each other and together form a substantially arc shaped second guide path. As shown in FIGS. 1 and 3, a releasable engaging mechanism 4c is provided between the extension halves 4a and 4b, so that the extension halves 4a and 4b can be engaged with and disengaged from each other.

[0027] As shown in FIGS. 2 to 4, a joint mechanism 2a is provided between the extension portion 4 and the base portion 3. The joint mechanism 2a includes a first hinge 2a1 and a second hinge 2a2. The first hinge 2a1 is made of resiliently deformable material and connects the base half 3a and the extension half 4a to each other. Also, the second hinge 2a2 is made of resiliently deformable material and connects the base half 3b and the extension half 4b to each other. Therefore, the extension halves 4a and 4b can pivot relative to the base halves 3a and 3b, respectively, as indicated by arrows in FIG. 3, due to resilient deformation of the first and second hinges 2a1 and 2a2. FIG. 3. shows an operative position of the extension portion 4 and FIG. 4 shows a storage position of the extension portion 4.

[0028] Referring to FIG. 4, a first storage position holding mechanism 2c1 is provided between the base half 3a and the extension half 4a in order to removably hold the extension half 4a against the base half 3a. Similarly, a second storage position holding mechanism 2c2 is provided between the base half 3b and the extension half 4b in order to removably hold the extension half 4b against the base half 3b. Therefore, the extension portion 4 can be removably held against the base portion 3 at the storage position. On the other hand, the releasable engaging mechanism 4c described above serves to hold the extension portion 4 in the operative position through engagement between the extension halves 4a and 4b.

[0029] In order to move the extension portion 4 from the operative position shown in FIG. 1 to the storage position shown in FIG. 2, the operator releases the engaging mechanism 4c so as to disengage the extension halves 4a and 4b from each other. Then, the operator pivots the extension halves 4a and 4b relative to the base portion 3 in opposite directions as indicated by arrows in FIG. 3. Therefore, the extension portion 4 can move from the operative position to the storage position without interacting with the screw strip 7. Hence, it is not necessary to remove the screw strip 7 from the tool.

[0030] On the other hand, in order to move the exten-

sion portion 4 from the storage position shown in FIG. 2 to the operative position shown in FIG. 1, the operator releases the holding mechanism 2c1 and 2c2 so as to release the extension halves 4a and 4b from the corresponding base halves 3a and 3b of the base portion 3. Then, the operator pivots the extension halves 4a and 4b relative to the base portion 3 in opposite directions as indicated by arrows in FIG. 4 until the extension halves 4a and 4b are positioned to receive opposite side edges of the screw strip 7. Then, the extension halves 4a and 4b are engaged with each other by the engaging mechanism 4c. In this way, it is possible to move the extension portion 4 from the storage position to the operative position without interacting with the screw strip 7.

[0031] As described above, according to this embodiment, the guide member 2 defines the arc-shaped guide path, so that the screw strip 7 can move along the guide path while the screws 7b are positioned on the inner circumferential side of the arc shape. The length of the guide path can be changed between the first length and the second length that is longer than the first length. For example, if the length of the screws 7b is short as shown in FIG. 2, the first length can be used. On the other hand, if the length of the screws 7b is long as shown in FIG. 1, the second length can be used. Also, the second length can be used when the screwdriver 1 is to be stored or if a working space is narrow. As a result, the operability of the screwdriver 1 can be improved.

[0032] In addition, as shown in FIG. 2, the guide member 2 has the base portion 3 and the extension portion 4. The base portion 3 defines the first length of the guide path and attached to the tool body 5. The extension portion 4 is pivotally connected to the end portion of the base portion 3 and can move between the operative position shown in FIGS. 1 and 4 and the storage position shown in FIG 2. In the operative position, the extension portion 4 defines the second length of the guide path in conjunction with the base portion 3. The extension portion 4 is pivoted toward the side of the tool body 5 to reach the storage position in such a manner that the extension portion 4 is folded on the base portion 3. Therefore, simply pivoting the extension portion 4 relative to the base portion 3 can change the length of the guide path of the guide member 2.

[0033] Further, the extension portion 4 has the extension half 4a for covering and guiding one side edge of the screw strip 7 from the outer side and the extension half 4b for covering and guiding the other side edge of the screw strip 7 from the outer side. The extension half 4a and the extension half 4b are separated from each other and are pivotally connected to the end portion of the base portion 3 independently of each other. Therefore, it is possible to pivot the extension portion 4 relative to the base portion 3 while the base portion 3 can serve to guide the screw strip 7. As a result, it is possible to change the length of the guide path of the guide member 2 without removing the screw strip 7 from the base portion 3.

[0034] Second to forth embodiments will now be described with reference to FIGS. 5 to 14. These embodiments are modifications of the first embodiment. Therefore, in FIGS. 5 to 14, like members are given the same reference numerals as the first embodiment and the description of these members will not be repeated.

(SECOND EMBODIMENT)

[0035] The second embodiment will now be described with reference to FIGS. 5 to 8. This embodiment is different from the first embodiment in that the joint mechanism 2a (see FIG. 4) and the releasable engaging mechanism 4c (see FIG 3) are replaced with a joint mechanism 2b and a releasable engaging mechanism 4d, respectively. Therefore, the second embodiment will be described focusing on these different mechanisms.

[0036] As shown in FIGS. 5 to 8, the joint mechanism 2b includes a shaft portion 3a3 formed on the base half 3a and a shaft receiving hole 4a3 formed in the extension half 4a for rotatably receiving the shaft portion 3a3. The joint mechanism 2b also includes a shaft portion 3b3 formed on the base half 3b and a shaft receiving hole 4b3 formed in the extension half 4b for rotatably receiving the shaft portion 3b3.

[0037] As shown in FIGS. 6 and 8, the joint mechanism 2b further includes a positioning projection 3a4 formed on the base half 3a and a positioning projection 3b4 formed on the base half 3b. First and second positioning holes 4a4 and 4a5 are formed in the extension half 4a. Similarly, first and second positioning holes 4b4 and 4b5 are formed in the extension half 4b. As shown in FIGS. 5 and 8, when the extension portion 4 is in the operative position, the positioning projections 3a4 and 3b4 engage the first positioning holes 4a4 and 4b4, respectively, so that the extension portion 4 can be held in the operative position. On the other hand, when the extension portion 4 is pivoted to the storage position on the side of the tool body 5 as shown in FIG. 6, the positioning projections 3a4 and 3b4 engage the second positioning holes 4a5 and 4b5, respectively, so that the extension portion 4 can be held in the storage position. The positioning projections 3a4 and 3b4 can be disengaged from the first positioning holes 4a4 and 4b4, respectively, by forcibly pivoting the extension portion 4 in the direction toward the storage position. Similarly, the positioning projections 3a4 and 3b4 can be disengaged from the second positioning holes 4a5 and 4b5, respectively, by forcibly pivoting the extension portion 4 in the direction toward the operative position. In this way, also with this embodiment, it is possible to change the length of the guide path of the guide member 2 without removing the screw strip 7 from the base portion 3.

(THIRD EMBODIMENT)

[0038] The third embodiment will now be described with reference to FIGS. 9 to 11. This embodiment is dif-

ferent from the first embodiment in that the joint mechanism 2a shown in FIG. 4 is replaced with a joint mechanism 2d and the releasable engaging mechanism 4c shown in FIG. 3 is replaced with a releasable engaging mechanism 4d. Therefore, the third embodiment will be described focusing on these different mechanisms.

[0039] The joint mechanism 2a includes rails 3a6 and 3b6 and engaging projections 4a6 and 4b6. The rails 3a6 and 3b6 are configured as recesses formed in the rear surfaces, which oppose to each other, of the base halves 3a and 3b of the base portion 3, respectively, and extend parallel to the lower edges (as viewed in FIGS. 9 to 11) of the base halves 3a and 3b. Alternatively each of the rails 3a6 and 3b6 may be formed by two parallel linear projections. The engaging projections 4a6 and 4b6 are formed on the upper portions (as viewed in FIGS. 9 to 11) of the extension halves 4a and 4b, respectively, and can be inserted into the respective rails 3a6 and 3b6 from their end portions so as to slidably engage therewith. For example, the rails 3a6 and 3b6 may be configured such that they can prevent removal of the engaging projections 4a6 and 4b6 in directions perpendicular to the rear surfaces of the base halves 3a and 3b, i.e., directions perpendicular to the sliding directions of the engaging projections 4a6 and 4b6.

[0040] The joint mechanism 2d further includes positioning projections 3a7 and 3b7 formed on the rear surfaces of the base halves 3a and 3b in positions adjacent to the rails 3a6 and 3b6, respectively. Also, positioning holes 4a7 and 4b7 are formed in the upper portions of the extension halves 4a and 4b, respectively. Therefore, the extension portion 4 can be held in the operative position by the engagement of the positioning projections 3a7 and 3b7 with the respective positioning holes 4a7 and 4b7 as shown in FIG. 9. In this way, also with this embodiment, it is possible to change the length of the guide path of the guide member 2 between the first length shown in FIG. 10 and the second length shown in FIG. 9. Thus, the first length shown in FIG. 10 can be achieved by removing the extension portion 4 from the base portion 3.

[0041] As described above, also with this embodiment, it is possible to change the length of the guide path by simply attaching the extension portion 4 to the base portion 3 or by removing the extension portion 4 from the base portion 3.

[0042] Further, the extension portion 4 has the extension half 4a for covering and guiding one side edge of the screw strip 7 from the outer side and the extension half 4b for covering and guiding the other side edge of the screw strip 7 from the outer side. The extension half 4a and the extension half 4b are separated from each other and are detachably attached to the end portion of the base portion 3 independently of each other. Therefore, it is possible to attach and remove the extension portion 4 while the base portion 3 can serve to guide the screw strip 7. As a result, it is possible to change the length of the guide path of the guide member 2 without

removing the screw strip 7 from the base portion 3.

(FOURTH EMBODIMENT)

[0043] The fourth embodiment will now be described with reference to FIGS. 12 to 14. This embodiment is different from the first embodiment in that the extension portion 4 is replaced with an extension portion 8. Therefore, the fourth embodiment will be described focusing on the extension portion 8.

[0044] The extension portion 8 includes a pair of bar-like parallel slide members 8a and 8b and blocks 8c and 8d attached between the slide members 8a and 8b. Each of the slide members 8a and 8b may be made of a metal wire that is bent to have an arc-shape. As shown in FIG. 14, two support portions 3d1 are formed on the outer side surface of the base half 3a. Similarly, two support portions 3d2 are formed on the outer side surface of the base half 3b. The slide member 8a is slidably inserted into the support portions 3d1. A removal preventing member 8a1 is attached to one end of the slide member 8a for preventing the slide member 8a from being removed from the support portions 3d1. Similarly, a removal preventing member 8b1 is attached to one end of the slide member 8b for preventing the slide member 8b from being removed from the support portions 3d2.

[0045] The block 8c is fixedly attached to the other ends of the slide members 8a and 8b opposite to the removal preventing members 8a1 and 8b1. The block 8d is slidably movably attached to the slide members 8a and 8b and is positioned between the block 8c and the removal preventing members 8a1 and 8b1.

[0046] As shown in FIG. 14, the block 8c has right and left guide portions 8c1 and right and left guide portions 8c2. The right guide portions 8c1 and 8c2 define a space for receiving one side edge of the screw strip 7 therebetween. The left guide portions 8c1 and 8c2 define a space for receiving the other side edge of the screw strip 7, therebetween. The right and left guide portions 8c2 are integrated with each other. In this way, a part of the guide path for the screw strip 7 is defined by the block 8c.

[0047] Similar to the block 8c, the block 8d has right and left guide portions 8d1 and right and left guide portions 8d2. The right guide portions 8d1 and 8d2 define a space for receiving one side edge of the screw strip 7 therebetween. The left guide portions 8d1 and 8d2 define a space for receiving the other side edge of the screw strip 7, therebetween. The right and left guide portions 8c2 are integrated with each other. In this way, another part of the guide path for the screw strip 7 is defined by the block 8d.

[0048] The slide members 8a and 8b can be slidably moved from a storage position on the side of the base portion 3 as shown in FIG. 12 to an operative position away from the base portion 3 as shown in FIG. 12 by withdrawing the slide members 8a and 8b from the base portion 3. The slide members 8a and 8b can be held in the storage position, the operative position or an inter-

mediate position between these positions by the frictional force that may be produced between the slide members 8a and 8b and their corresponding support portions 3d1 and 3d2. In the storage position shown in FIG. 13, the blocks 8c and 8d are positioned proximally to the base portion 3. In the operative position shown in FIG. 12, the block 8d is positioned at a middle position along the length of the slide members 8a and 8b. To this end, the block 8d is slid along the slide members 8a and 8b to the middle position after the slide members 8a and 8b have been moved from the position shown in FIG. 13 to the position shown in FIG. 12. The block 8d can be held at any position including the middle position by the frictional force that may be produced between the block 8d and the slide members 8a and 8b. Therefore, it is possible to change the length of the guide path of the guide member 2 between the first length shown in FIG 13 and the second length shown in FIG. 12 without removing the screw strip 7 from the base portion 3,

[0049] As described above, the guide member 2 has the base portion 3 defining the first length of the guide path along the arc and the extension portion 8 that is slidably attached to the base portion 3. By withdrawing the extension portion 8 from the base portion 3, the extension portion 8 can be slidably moved from the storage position shown in FIG. 13 to the operative position shown in FIG 12, where the extension portion 4 defines the second length of the guide path in conjunction with the base portion 3. Therefore, simply sliding the extension portion 4 relative to the base portion 3 can change the length of the guide path of the guide member 2.

[0050] The present invention may not be limited to the above embodiments but may be modified in various ways. For example, the following modifications can be envisaged:

- (1) The length along the guide path of the guide member can be changed between the first length and the second length in each of the first to third embodiments. However, it is possible to configure that the length along the guide path can be changed between three or more different lengths by using a plurality of extension portions that have different lengths and can be selectively attached to the base portion or by connecting an additional extension member(s) to the extension portion. The additional extension member (s) also may be configured to be able to freely adjust the extending length as in the fourth embodiment.
- (2) The base portion of the guide member of each of the first to fourth embodiments is directly attached to the tool body 5 of the screwdriver 1. However, the base portion may be attached to the base casing 6a of the feeding device 6. In other words, the base portion may be attached to the tool body 5 via the base casing 6a.
- (3) Although the slide members 8a and 8b of the fourth embodiment are configured as bars, they may be configured as plates or any other suitable config-

urations.

(4) Although the first to fourth embodiments have been described in connection with screwdrivers for driving screws, the present invention also may be applied to any other power tools for driving fasteners other than screws. For example, the present invention may be applied to power tools for driving nails and rivets.

It is explicitly stated that all features disclosed in the description and/or the claims are intended to be disclosed separately and independently from each other for the purpose of original disclosure as well as for the purpose of restricting the claimed invention independent of the compositions of the features in the embodiments and/or the claims. It is explicitly stated that all value ranges or indications of groups of entities disclose every possible intermediate value or intermediate entity for the purpose of original disclosure as well as for the purpose of restricting the claimed invention, in particular as limits of value ranges.

Claims

1. A screwdriver (1) comprising:

a guide member (2) for guiding a screw strip (7) that carries a plurality of screws (7b) arranged at intervals along a length of the screw strip (7), and
a feeding device (6) for feeding the screw strip (7) such that the screws (7b) of the screw strip (7) are positioned one after another to a position for driving by a driver bit (5g),
wherein the guide member (2) defines an arc-shaped guide path having a length, so that the screw strip (7) can move along the guide path,
characterized in that:
the guide member (2) is configured such that the length of the guide path can be varied at least between a first length and a second length that is longer than the first length.

2. The screwdriver (1) as in claim 1, **characterized in that:**

the guide member (2) has a first portion (3) and a second portion (4);
the first portion (3) defines the first length of the guide path and is attached to the side of a tool body (5) of the screwdriver (1);
the second portion (4) is pivotally connected to the first portion (3) and can be moved between an operative position and a storage position;
when the second portion (4) is in the operative position, the first portion (3) and the second portion (4) together defines the second length of

the guide path.

3. The screwdriver (1) as in claim 2, **characterized in that:**

the second portion (4) includes a first half (4a) and a second half (4b);
the first half (4a) is configured to cover a first side edge of the screw strip (7) from the outer side;
the second half (4b) is configured to cover a second side edge opposite to the first side edge of the screw strip (7) from the outer side; and
the first half (4a) and the second half (4b) are pivotally connected to the first portion (3) independently of each other.

4. The screwdriver (1) as in claim 1, **characterized in that:**

the guide member (2) has a first portion (3) and a second portion (4);
the first portion (3) defines the first length of the guide path and is attached to the side of a tool body (5) of the screwdriver (1);
the second portion (4) is removably attached to the first portion (3) for defining the second length of the guide path together with the first portion (3).

5. The screwdriver (1) as in claim 4, **characterized in that:**

the second portion (4) includes a first half (4a) and a second half (4b);
the first half (4a) is configured to cover a first side edge of the screw strip (7) from the outer side;
the second half (4b) is configured to cover a second side edge opposite to the first side edge of the screw strip (7) from the outer side; and
the first half (4a) and the second half (4b) are respectively removably attached to the first portion (3) independently of each other.

6. The screwdriver (1) as in claim 1, **characterized in that:**

the guide member (2) has a first portion (3) and a second portion (8);
the first portion (3) defines the first length of the guide path and is attached to the side of a tool body (5) of the screwdriver (1);
the second portion (8) is slidably mounted to the first portion (3) and can slide between an operative position and a storage position on the side of the first portion (3);
when the second portion (8) is in the operative

position, the second portion (8) defines the second length of the guide path together with the first portion (3).

7. A fastener guide device for a power tool (1), the fastener guide device being operable to guide a fastener strip (7) carrying a plurality of fasteners (7b) arranged at intervals along a lengthwise direction, comprising:

a guide member (2) defining a guide path for the fastener strip (7), **characterized in that:**
the guide member (2) is configured such that the length of the guide path can be varied.

8. The fastener guide device as in claim 7, **characterized in that**
the guide member (2) includes:

a first portion (3) for defining a first part of the guide path; and
a second portion (4; 8) for defining a second part of the guide path; and
the second part extends in series with the first part.

9. The fastener guide device as in claim 8, **characterized in that** the first portion (3) and the second portion (4) are pivotally connected to each other.

10. The fastener guide device as in claim 8, **characterized in that** the first portion (3) and the second portion (4) are removably attached to each other.

11. The fastener guide device as in claim 8, **characterized in that** first portion (3) and the second portion (8) are slidably movable relative to each other.

12. The fastener guide device as in any one of claims 8 to 11, **characterized in that** one of the first and second portions (3, 4) is divided into a first half (4a) and a second half (4b).

13. The fastener guide device as in any one of claims 8 to 12, **characterized in that** one of the first and second portions (3, 4; 3, 8) is fixedly attached to a tool body (5) of the power tool.

14. The fastener guide device as in any one of claims 7 to 13, **characterized in that** the guide path is curved along an arc.

15. A power tool (1) comprising the fastener guide device as in any one of claims 7 to 14.

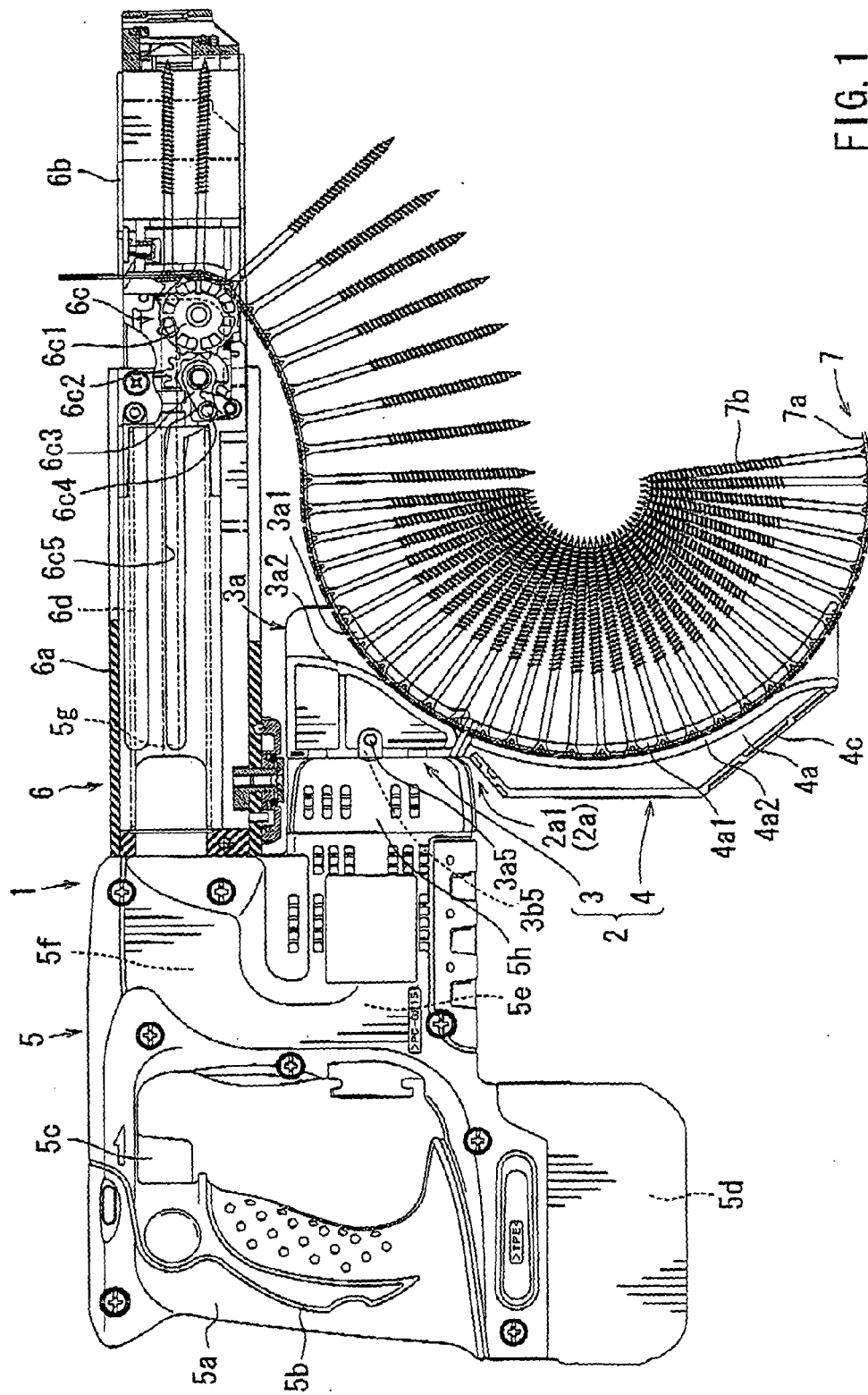


FIG. 1

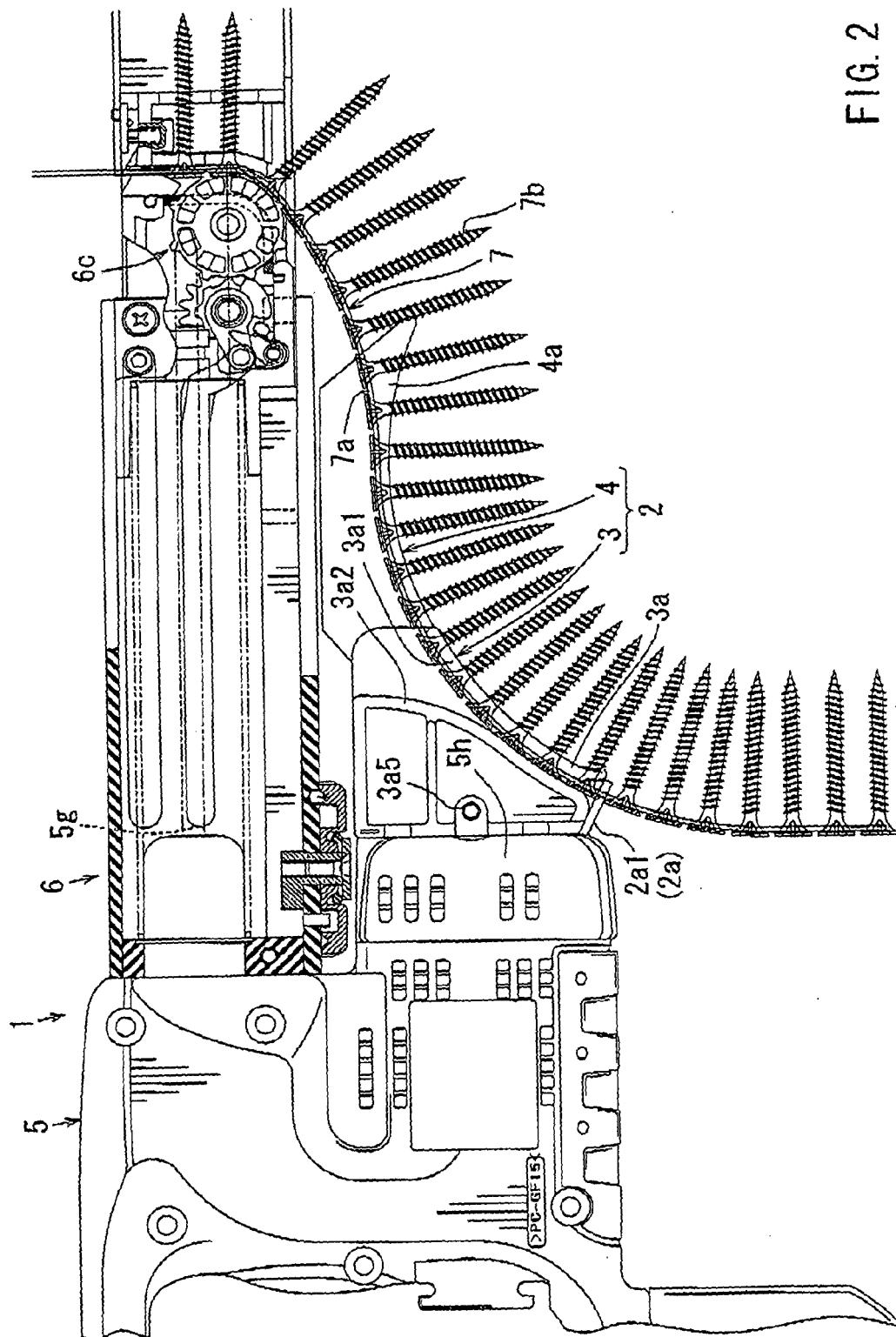


FIG. 2

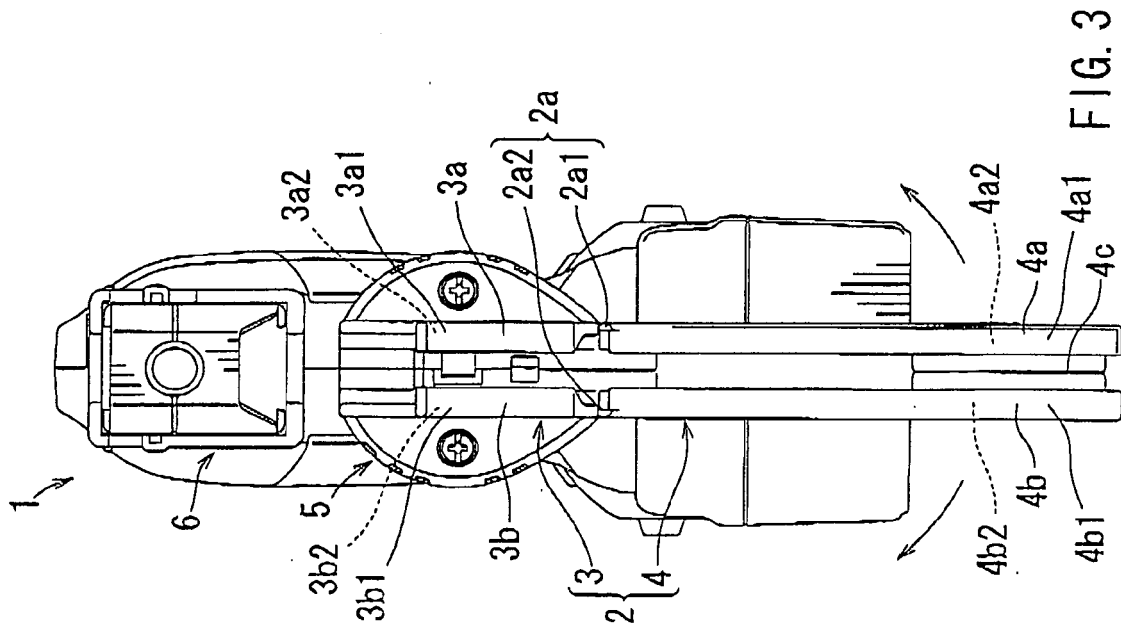


FIG. 3

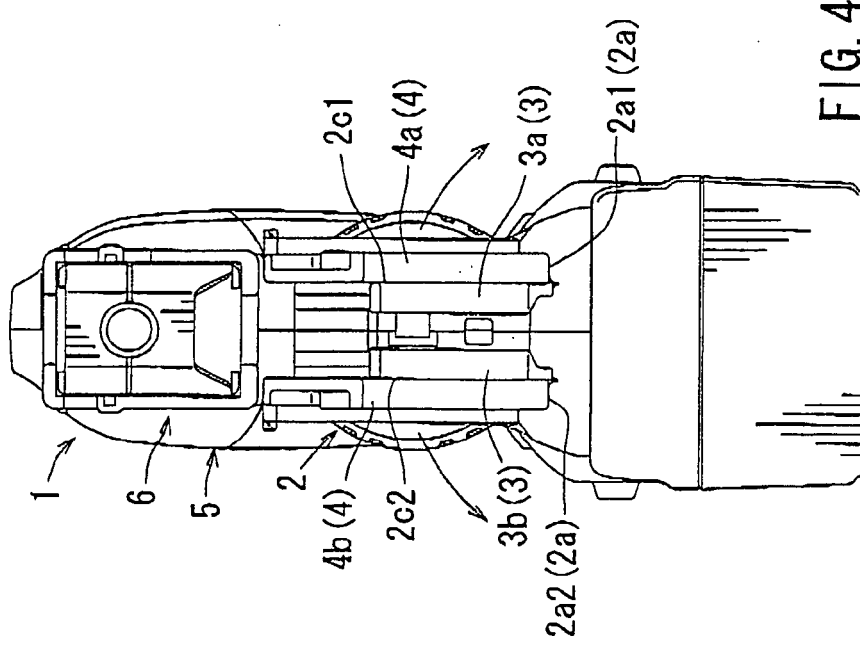
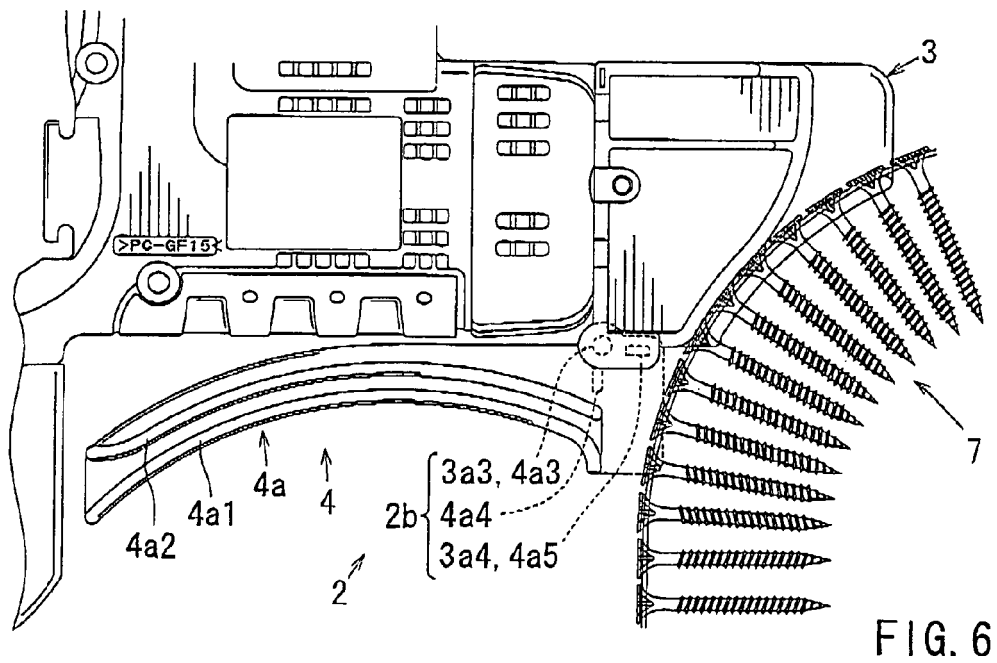
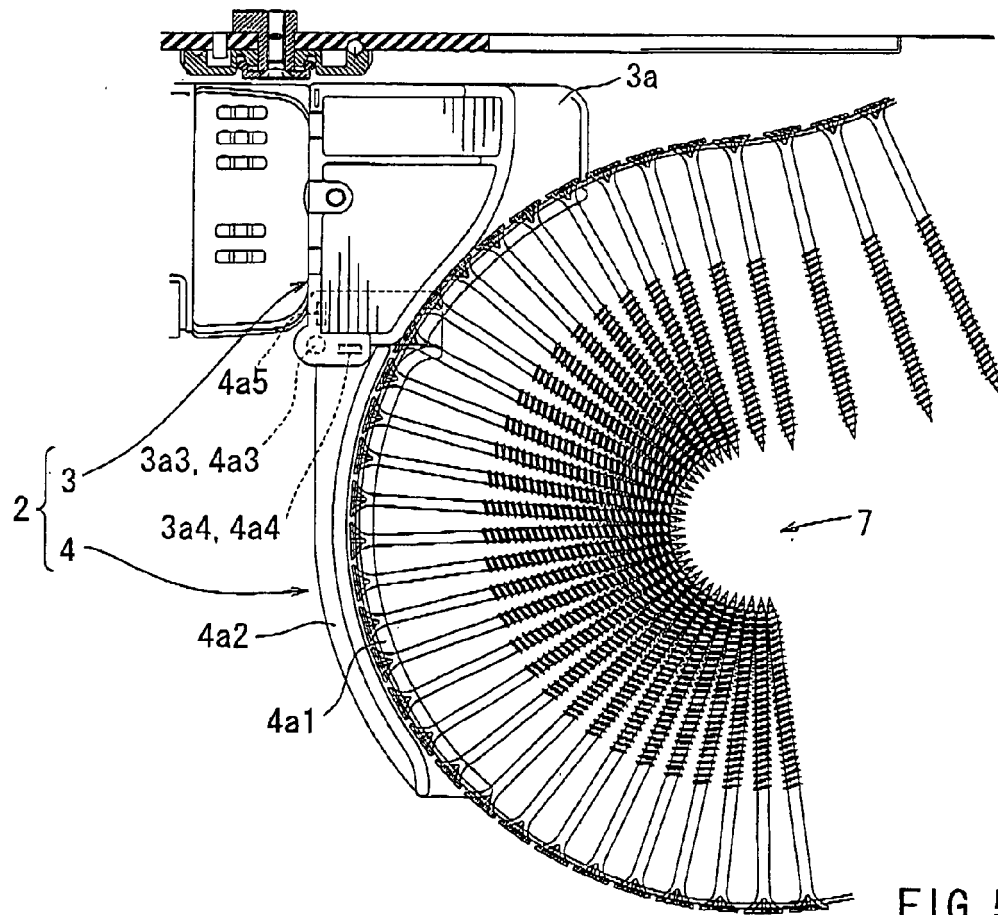


FIG. 4



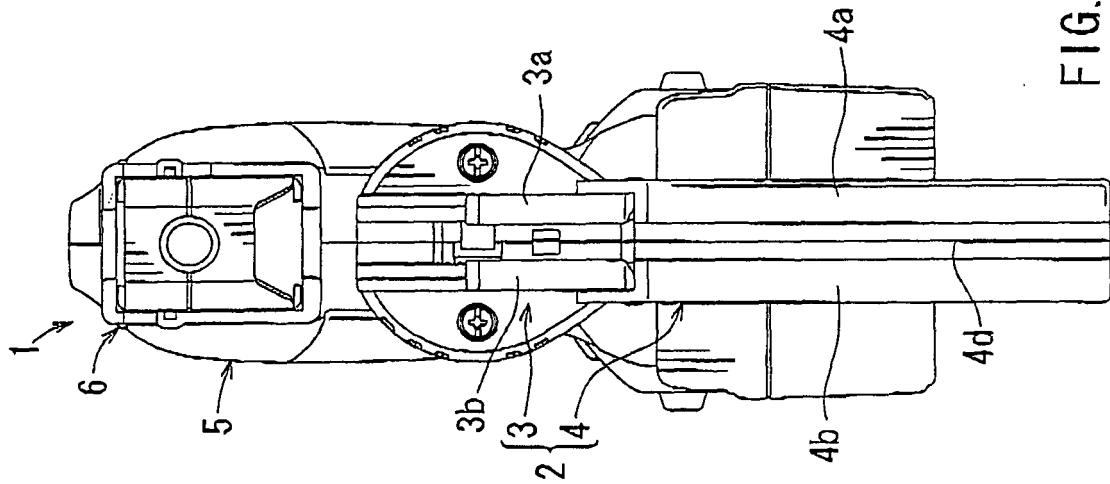


FIG. 7

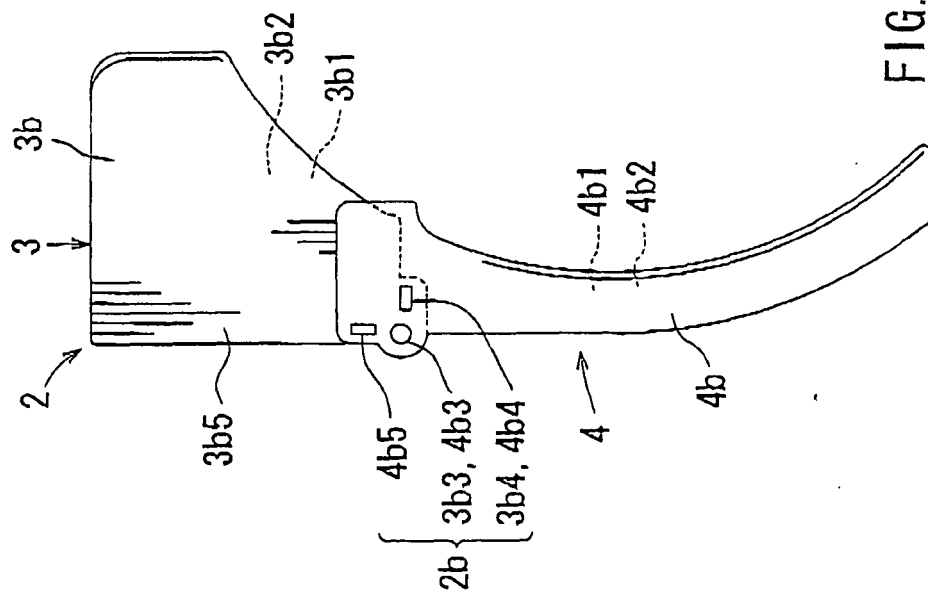
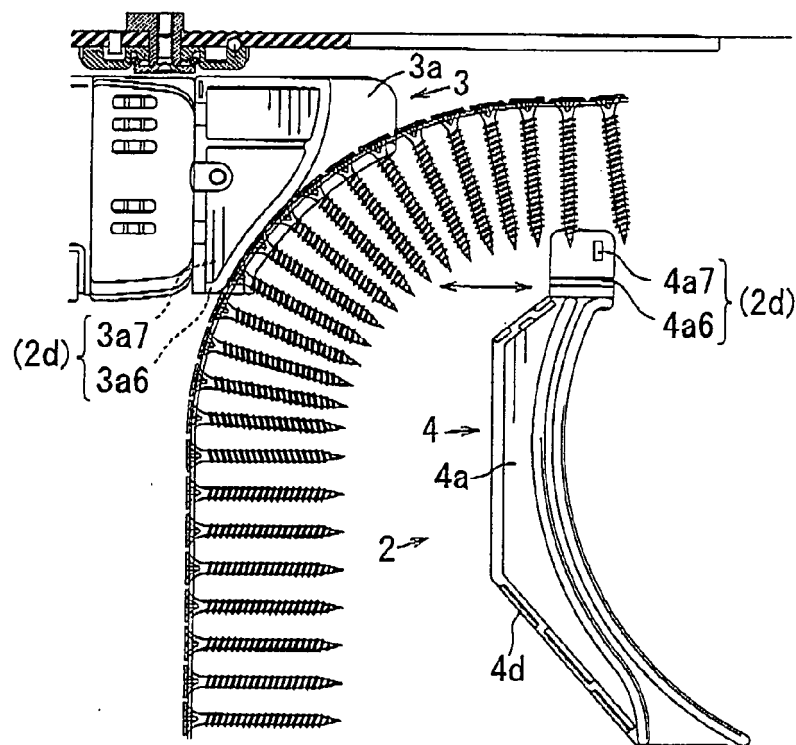
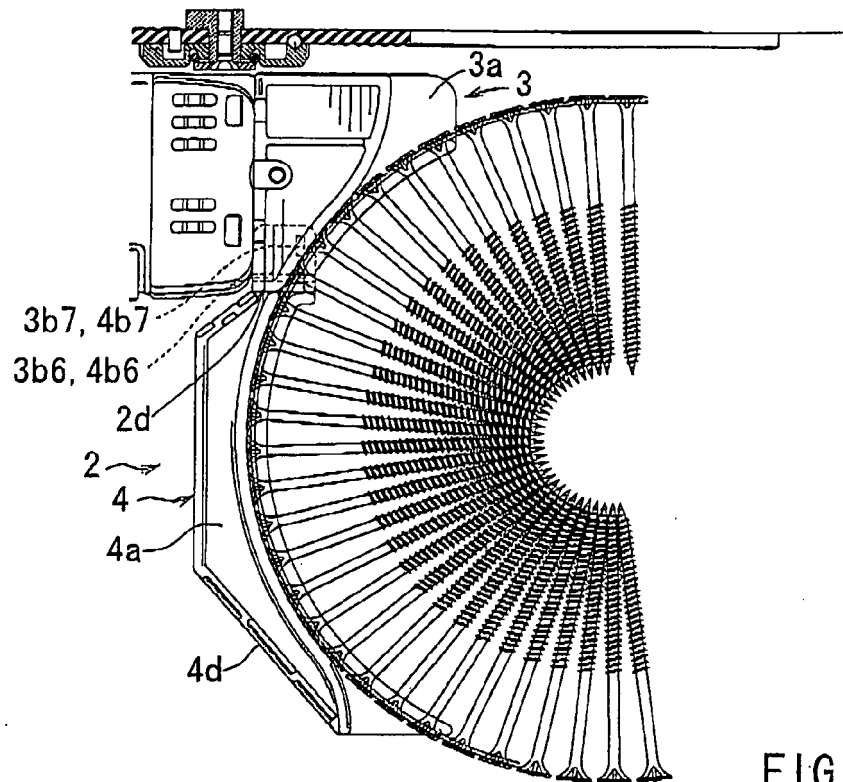


FIG. 8



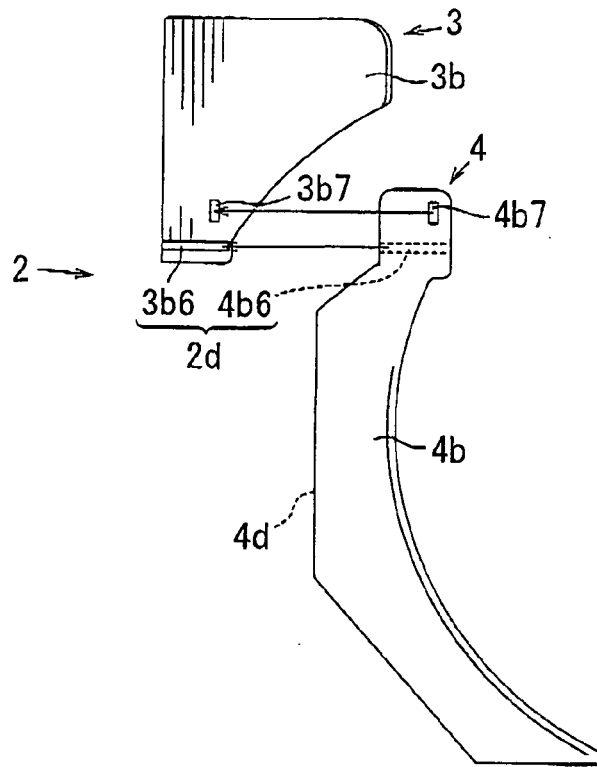


FIG. 11

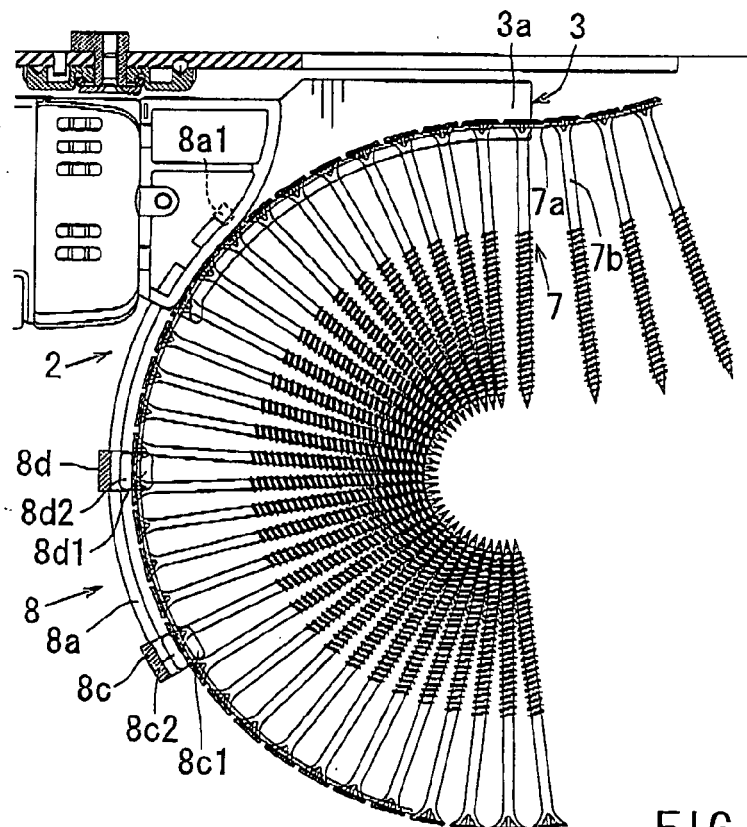


FIG. 12

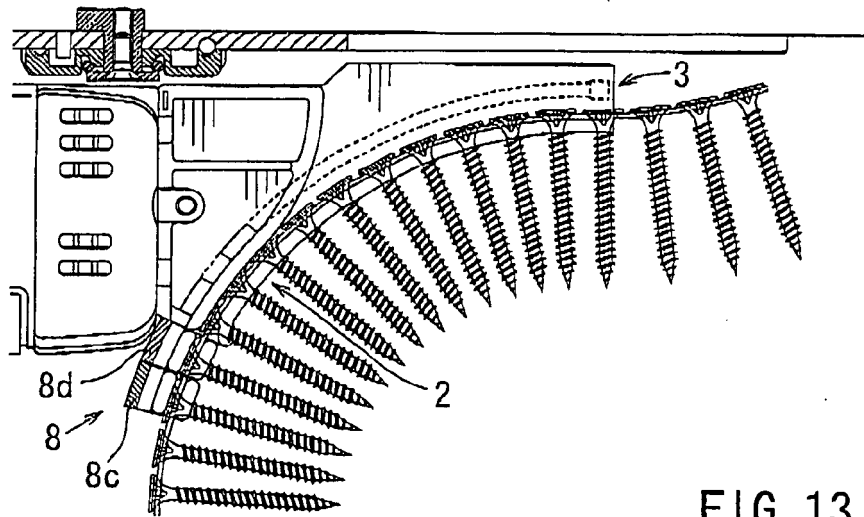


FIG. 13

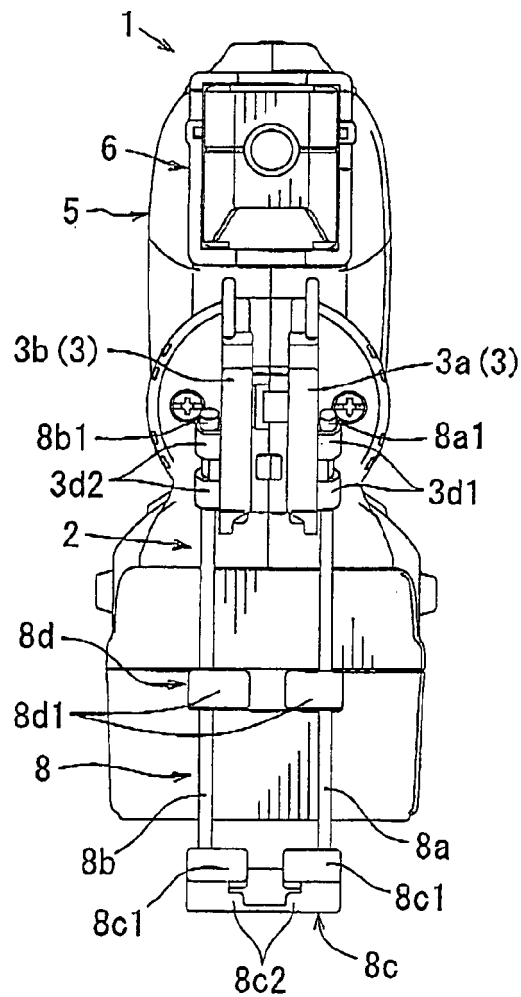


FIG. 14

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2006302560 A [0001]
- JP 5104456 A [0003]
- JP 8155847 A [0003]
- WO 5104456 A [0003]
- WO 8155847 A [0004]