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REPLACED SHEETS SG
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DESCRIPTION

DEVICE FOR BINDING DOCUMENTS AND THE LIKE

TECHNICAL FIELD

This invention relates to a device for binding sheets of paper such as documents in a file folder.

BACKGROUND ART

Fig. 10 shows a binder 10 of this type disclosed in Japanese Utility Model Publication No. 5-5022. The binder 10 is used with a file cover F, which comprises a front cover portion F1, a spine strip F2, and a rear cover portion F3, a portion of which adjoining the spine strip F2 is folded to form a folded cover potion F4, to which a prong means 4 is attached. The prong means 4 comprises a pair of binding prongs 41, which are passed through the folded cover portion F4.

The binder further comprises an elongated pressing plate 110, which is provided on its upper face with an upwardly bulged wall 120 extending longitudinally of the plate 110. The bulged wall 120 is provided at the front side thereof (which is directed to the lower right in the figure) with a pair of windows 130 spaced apart from each other longitudinally of the plate 110, through which a pair of binding prongs 41 are to be drawn out. Each of the windows 130 communicates through a cavity 140 formed in the plate 110 with a hole 150 formed in the bottom of the plate 110, through which one of the prongs 41 is to be introduced into the cavity 140. The prongs 41 are flat strips of resiliently flexible material having a width and the holes

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150 have such a length (longitudinally of the plate 110) greater than the width of the prongs 41 that the prongs 41 are inserted through the holes 150. Each of the holes 150 has one half portion (at the upper right side in the figure) of a width (perpendicular to the length of the plate 110) greater than the other half portion, which is gradually displaced from the front edge of the plate 110 and becomes narrower toward the other (lower left) end.

The binding prongs 41 are passed through a pair of holes D1 formed in one side portion of the documents D to be bound and further through the windows 130. Then the pressing plate 110 is pressed on the documents D and then slid thereon in the upper right direction in the figure thereby to fix the prongs 41 between the ceilings of the cavities 140 and the upper surface of the pressing plate 110, whereupon the documents D are bound by the binder 10 as illustrated by imaginary lines in Fig. 10.

When the bound documents are to be opened, the pressing plate 110 is slid from the position indicated by imaginary lines toward the lower left thereby to release the prongs from engagement with the plate 110. Then the plate 110 is raised and while it is held by one hand, the outer end portion of each of the prongs 41 is moved by the other hand into engagement in a gap between the ceiling of each of the cavities 140 and the upper surface of the pressing plate 110 as indicated by real lines in Fig. 10, whereupon the plate 110 is fixed to the outer end portions of the prongs 41. Under the condition, by moving some of

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the documents D to those portions of the prongs which are exposed below the pressing plate 110 it is possible to turn the pages with ease.

In the known arrangements, however, it is necessary to hold the binder 10 above the bound documents by one hand and move by the other hand the prongs 41 one by one to the left side of each of the cavities 140. in other words, both hands must be used to engage the binder 10 held above the documents with the outer end portions of the prongs 41. This is quite inconvenient.

On the other hand, by sliding the pressing plate 110 in contact with the documents D in the upper right direction as shown by imaginary lines it is possible to bring the prongs 41 simultaneously into engagement with the plate 110.

However, if a large stack of documents are to be bound, friction between the under surface of the plate 110 and the upper surface of the stack causes some of the documents in the upper portion of the stack to follow the plate 110 as it is slid to the upper right so that the stack of documents would be deformed into a parallelepiped. As a result, an extraordinary force is applied to the holes D1 in the documents D through which the binding prongs 41 are inserted thereby to damage the edges of the holes. The prongs 41 of this type used in the binder are usually in the form of long, narrow strips having lateral edges, which act like a knife edge to cut the peripheries of the holes in the bound documents as the documents are caused to slide

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relative to the prongs in the above-mentioned manner.

DISCLOSURE OF THE INVENTION

This invention has been accomplished to solve the above problems and has its object the provision of a binder in which the operation of bringing the binding prongs into and out of engagement with a fastener can be performed with a single hand without causing any damaging force to be applied to the documents to be bound even when the fastener is in contact with or near he documents as it is operated.

The device of the invention comprises an elongated, rectangular guide member provided with holes for a plurality of binding prongs to be inserted through, and a fastening member combined with the guide member slidably along the length thereof, whereby the prongs passed through the holes in the guide member can be bent into a fastened position at the same time by sliding the fastener relative to the guide member.

In a preferred embodiment of the invention, the fastener is provided with a pair of windows through which the binding prongs are to be passed and a pair of slits each communicating with one of the windows. Each of the windows is provided with an obliquely extending guide edge for helping bend each of the prongs inserted through the windows as the fastener is slid relative to the guide member and guiding each of the bent prongs into the corresponding one of the slits.

With the binder of the above-mentioned structure, by fixing the binding prongs to a file cover and inserting the

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prongs through the holes formed in the guide member it is possible to fix the guide member to the file cover, and by sliding the fastener mounted on the guide member longitudinally thereof it is possible to bent the prongs at the same time into engagement with the fastener. By sliding the fastener in the opposite direction it is possible to release the prongs from the fastener.

In particular, with the guide member and the fastener being held between the thumb and forefinger of one hand, by moving the two fingers in opposite directions it is possible to slide the fastener relative to the guide member thereby to cause the prongs inserted through the holes in the guide member and the windows in the fastener to be bent by the obliquely extending edges of the windows and guided into the slits associated with the windows to be securely held therein.

With the binder of this invention, by a simple operation with a single hand it is possible to raise the fastener above the bound documents and fix it to the prongs at a position of a desired height, thereby to leave a sufficient length of each of the prongs exposed above the documents and below the fastener to make turning of the pages of the documents easy. It is also possible to change the above length of the prongs to be left exposed with ease and without using both hands.

Even when the fastener is in close contact with the documents, it is also possible to operate the fastener without causing an extraordinary force to be applied to the

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documents. In particular, the fastener can be slid relative to the guide member even when the member is kept stationary in close contact with the documents. Under the condition, with the guide member on the documents being held by a finger, the fastener can be slid into engagement with the prongs by another finger without causing any frictional force to act on the documents in the facial direction thereof while effectively preventing distortion of the stacked documents to damage the holes therein through which the prongs are passed. The binder of the invention has a particular advantage when a large stack of documents is to be bound.

The guide member and the fastener are combined in such a manner that the two members are slidable longitudinally relative to each other. To this end, either one of the two members are provided on each of the opposite lateral sides thereof with a guide rail extending the whole length of the member while the other member is provided with corresponding grooves, which the rails slidably engage so that the two members can slide relative to each other.

In order to enable smooth fastening of the binding prongs by a simple mechanism, the fastener is provided with a pair of right-angled triangular windows, the oblique side of each of which is to be used as the previously mentioned oblique guide edge.

To make the fastening of the prongs securer, between the fastener and the upper surface of the guide member there may be formed a space for accommodating the bent

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portion of each of the binding prongs, and on the surface of the guide member there may advantageously be formed a projection for engaging the bent portion of the prong within the space.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a partly cut-out perspective view of a binding device embodying the invention, shown in its operative condition to bind documents or sheets of paper to a file folder; Fig. 2 is a perspective view of the binder of Fig. 1 shown in a different operative position in which binding has been completed; Fig. 3 is a sectional view taken along line A-A of Fig. 2; Fig. 4 is a sectional view taken along line B-B of Fig. 2; Fig. 5 is a sectional view taken along line C-C of Fig. 2; Fig. 6 is a bottom view of a fastener for securing binding prongs; Fig. 7 is a perspective view showing documents bound by the device of the invention; Fig. 8 is a perspective view showing the fastener raised along the prongs above the documents; Fig. 9 is a perspective view showing the fastener operated by one hand in a single action; and Fig. 10 is a perspective view of a conventional binder.

BEST MODE OF EMBODYING THE INVENTION

Fig. 1 is a partly cut-out perspective view showing a binding device in accordance with a preferred embodiment of this invention and which shows a pre-step to bind a stack of documents. Fig. 2 is a perspective view of the binder of Fig. 1 shown in a different operative position in which binding has been completed. Fig. 3 is a sectional view

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taken along line A-A of Fig. 2, Fig. 4 is a sectional view taken along line B-B of Fig. 2, and Fig. 5 is a sectional view taken along line C-C of Fig. 2. Fig. 6 is a bottom view of a fastener for securing binding prongs which constitute a binding device.

As shown in Fig. 1, the binding device 1 in accordance with the invention comprises an elongated guide member 2 and a fastener 3 guided by and longitudinally slidable on the guide member 2. The device 1 further comprises a prong means 4 to bind documents D in a file folder. The binder of the invention can be used to bind not only documents but also other various kinds of sheets of paper such as drawing sheets, photograph mounts, scraps from newspapers or magazines, setting boards for botanical specimens, various types of slips, etc.

The prong means 4 comprises an elongated base plate 42 provided near the opposite ends thereof with a pair of binding prongs 41 made of a flat strip of resiliently flexible material and extending in the same plane from the same surface of the plate 42 perpendicularly thereto. Each of the prongs 41 has an outer end portion tapered toward a free end, which is thickened on one of its flat lateral surfaces to form a catch hook 43. Each of the prongs 41 is provided at its opposite lateral sides adjacent its lower end with a lower hook 44, which defines a relatively constricted end portion 45 between the hook 44 and the upper surface of the base plate 42.

A file folder F comprises a front cover F1, a spine

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strip F2, a rear cover F3 and a folded double-layer portion F4 formed by folding a lateral portion of the rear cover F3 adjacent the spine strip F2 into the double-layer portion F4. The prong means 4 is fixed to the folder F by passing the prongs 41 through holes formed in the folded cover portion F4 from its underside, with the relatively constricted portions 45 of the prongs 41 occupying the holes and the lower hooks 44 preventing the prongs 41 from falling off therefrom.

The prong means 4 is made of a synthetic resin, and the prongs 41 and the base plate 42 are molded integrally into a single member by injection molding. As the synthetic resin that can be used, polyvinyl chloride, polyethylene, polypropylene, etc. are preferred. Any other suitable materials, if flexible, may also be used.

In the illustrated embodiment, the binding prong means 4 is composed of the binding prongs 41 and the base plate 42. It is not restricted to the illustrated shape and structure, but the whole of the prong means may be composed of a single strap or string. The base plate 42 may be omitted, and the binding prongs 42 alone may be fixed directly to the folded cover portion F4 of the folder F.

The guide member 2 consists of an elongated plate made of a relatively rigid suitable material such as a hard synthetic resin. The upper portion of each of the opposite lateral sides of the guide member 2 is formed into a laterally projecting guide rail 21 running the whole length of the guide member 2. The guide member 2 is provided with

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a pair of holes 22, one of which is formed adjacent one end (the left end in the figure) of the member while the other is spaced a distance from the opposite end (the right end in the figure) of the member toward the center thereof. The hole 22 are provided to fix the guide member 2 to a part of the file folder F, and can be omitted if the guide member 2 is not to be fixed to the folder F.

In the guide member 2, adjacent the above-mentioned holes 22 toward the right thereof and on that lateral side of the longitudinal center line of the member 2 which is adjacent the spine strip F2 of the folder F, there are formed another pair of holes 23 through which the binding prongs 41 are to be inserted. The distance between the two holes 23 is substantially equal to that between the two binding prongs 41. On the upper surface of the guide member 2 at the lateral side of each of the holes 23 remote from the spine strip F2 of the folder F there is formed an engaging projection 24 extending longitudinally of the member 2 a distance slightly longer than the longitudinal dimension of the holes 23.

The fastener 3 is an elongated member of a suitable material shaped like the letter of C in transverse section with its opening facing downward. In the opposite lateral inner surfaces of the elongated member of the fastener 3, a pair of longitudinally extending guide grooves 31 complementary to the previously described guide rails 21 of the guide member 2 are formed defining a pair of longitudinally extending banks or shelves 31a. With the

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rails 21 complementarily engaging the grooves 31, the fastener 3 is longitudinally slidable along the rails 2.

In the opposite end portions of the upper wall of the fastener 3 there are formed a pair of right-angled triangular windows 32 each having an oblique side positioned at the left and one of the other two sides open in the lateral or front wall of the member 3 toward the documents to be bound. The windows 32 are formed in correspondence to the holes 23 in the guide member 2 at such positions that with the fastener 3 slid leftward a short distance relative to the guide member 2, the portions adjacent the vertices of the triangles of the windows 32 coincide with the holes 23 in the guide member 2.

In the above-mentioned lateral or front wall of the fastener 3 there is formed a slit 36 extending leftward from the previously mentioned one open side of the triangle of each of the windows 32. The slits 36 are formed in correspondence to the holes 23 in the guide member 2 at such positions that with the guide member 2 completely contained in the fastener 3 as shown in Fig. 2, the slits 36 in the fastener 3 are laterally aligned with the holes 23 in the guide member 2. With the binding prongs 41 inserted through the holes 23 in the guide member 2 and the windows 32 in the fastener 3 as shown in Fig. 1, as the fastener 3 is slid on the guide 2 toward the right in the figure, the oblique sides 32a of the triangular windows 32 bend the prongs 41 forwardly and guide them into the slits 36 as shown in Fig. 2, wherein those portions of the upper

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wall of the fastener 3 at the left side adjacent the oblique sides of the windows 32 completely cover the holes 23 of the guide member 2.

In the inner surface of the top wall of the fastener 3 at the opposite longitudinal ends thereof, there are formed a pair of grooves 33 in correspondence to the linear engaging projections 24 on the upper surface of the guide member 2 so that as the two members 2 and 3 are slid relative to each other, the projections 24 engage the grooves 33 thereby to prevent mutual interference between the ceiling of the member 3 and the projections 24.

As shown in Figs. 4 and 6, below each of the windows 32 and communicating therewith there is formed a cavity or space 34 for accommodating the binding prong 41 which covers the hole 23 and the linear projection 24 under the condition that the fastener 3 is displaced relative to the guide 2 as shown in Fig. 1 and also under the condition that the guide 2 is completely contained in the fastener 3 as shown in Fig. 2. As shown in Figs. 5 and 6, between the right and left cavities 34 there is formed a relatively large cavity 35 having a ceiling a little higher than the upper surface of the guide member 2. The previously mentioned banks or shelves 31a defining the grooves 31 do not extend along the cavity 35.

The guide member 2 and the fastener 3 are made of a suitable hard synthetic resin by injection molding. The resin may be selected from hard polyethylene, hard polypropylene, polyvinyl chloride, polystyrene,

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acrylonitrile styrene, acrylonitrile butadiene styrene, polymethyl metacrylate, polyvinylidene chloride, polyethylene terephthalate, polyamide, polyacetal, polycarbonate, polybuthylene terephthalate, etc. Any other materials having suitable hardness and rigidity may also be used.

The device of the invention is used to bind documents D in the following manner. As shown in Fig. 1, the fastener 3 is slid on the guide member 2 so that the holes 23 in the member 2 coincide with and are exposed in the windows 32. The binding prongs 41 that have been passed through perforations in the documents D are inserted upward through the holes 23 and the windows 32 from the underside of the guide member 2 so that the upper portions of the prongs stand upright above the fastener 3.

Then as the fastener 3 is slid on the guide member 2 to the upper right in Fig. 2, the oblique sides of the windows 32 push and bend the prongs 41 laterally or substantially perpendicularly to the longitudinal direction of the fastener 3 and the guide member 2 until the prongs 41 are introduced into the slits 36 from within the windows 32 and lie flat on the documents D that have just been bound by the device.

Under the condition that the fastener 3 has completely coincided with the guide member 2, the prongs 41 laterally project from the slits 36 of the windows 32 of the fastener 3 so as to lie on the documents D, with the projections 24 on the upper surface of the guide member 2 engaging the

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step-like projections 41a formed on that lateral surface of each of the prongs 41 which faces downward, thereby preventing the prongs 41 from being pulled out of the fastener 3 even when a force is applied to the documents D to remove them from the binding device.

The above state is shown in Fig. 7, wherein the documents D placed on the inner surface of the rear cover F3 of the folder F are bound by the prongs 41 fixed to the folded portion F4 of the folder and pressed and held by the device within the folder, the outer bent portions of the prongs lying on the documents D.

In order to make it easy to turn the pages of the bound documents D and have the documents kept open stably at a desired page, the fastener 3 is slid to the lower left as shown by an arrow in Fig. 7 as far as the holes 23 in the guide member 2 come to be exposed through the windows 32 so that the prongs 41 are released from the engagement with the fastener 3, whereupon the fastener 3 is raised a little above the documents D as shown in Fig. 8. Then the fastener 3 is again slid to the upper right so as to engage the prongs 41 again so that the fastener 3 will not be slipped out therefrom. Under the condition, the pages of the documents D can be turned with ease, and the documents D can be kept open stably.

Since the device 1 of the invention is composed of the guide member 2 and the fastener 3 combined with and slidable on the guide member 2, the operation of sliding the fastener 3 relative to the guide member 2 raised above

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the documents can be conducted in a single action by holding the device by one hand and sliding the fastener to the upper right by the thumb relative to the guide member 2 held by the forefinger as shown in Fig. 9. Reversely, by sliding the fastener 3 to the lower left by the thumb it is possible to release the prongs 41 from the engagement with the fastener 3 by a single operation.

In the illustrated embodiment, the fastener 3 is provided with the pair of right and left windows 32, through which the binding prongs 41 project upward. Instead of the windows, the fastener 3 may be provided with a space like the space 35 at the same side of and communicating with each of the spaces 34 for introducing the prongs, so that the prongs inserted through the holes 23 in the guide member 2 into the spaces 34 may be introduced into the respective adjoining spaces. In this arrangement, when the documents D have been bound to the rear cover F2, the prongs 41 do not project from on the surface of the fastener so that the folder F with the binder 1 affixed thereto may have a good appearance.

POSSIBILITY OF USE IN INDUSTRY

The device for binding documents and the like in accordance with invention is suitable for binding a stack of papers, photograph mounts, or catalogue or the like.

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CLAIMS

1. A device for binding documents and the like comprising: an elongated guide member provided with a plurality of holes through which binding prongs are to be passed; a fastener combined with said guide member in such a manner that said fastener is slidable longitudinally relative to said guide member thereby to fasten said prongs passed through said holes to a binding position; whereby said prongs passed through said holes in said guide member are bent at the same time by sliding said fastener relative to said guide member so as to be engaged by said fastener.

2. A device for binding documents and the like comprising; an elongated guide member provided with a plurality of holes through which binding prongs are to be passed; a fastener combined with said guide member in such a manner that said fastener is slidable longitudinally relative to said guide member thereby to fasten said prongs passed through said holes to a binding position; wherein said fastener is provided with; a plurality of windows through each of which one of said prongs is to be passed; and a plurality of slits each continuous from one of said windows for holding therein the bent portion of that one of said prongs which is passed through said one window; each of said windows being provided with an oblique edge for bending said one prong passed through said window and guiding said bent prong into the corresponding one of said slits to be held therein as said fastener is slid relative to said guide member.



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3. The device as described in claim 1 or 2, wherein one of said guide member and said fastener is provided on each of the opposite lateral sides thereof with a rail extending longitudinally thereof, and the other of said guide member and said fastener is provided with corresponding grooves which said rails engage so that said guide member and said fastener are slidable relative to each other.

4. The device as described in claim 2, wherein said windows are shaped like a right-angled triangle in top plan view, one side of which constitutes said oblique guide edge.

5. The device as described in claim 2, wherein between said fastener and the upper surface of said guide member a space is provided for accommodating the bent portion of each of said prongs, and on the surface of said guide member a projection is provided for engaging the bent portion of said prong in each of said space.

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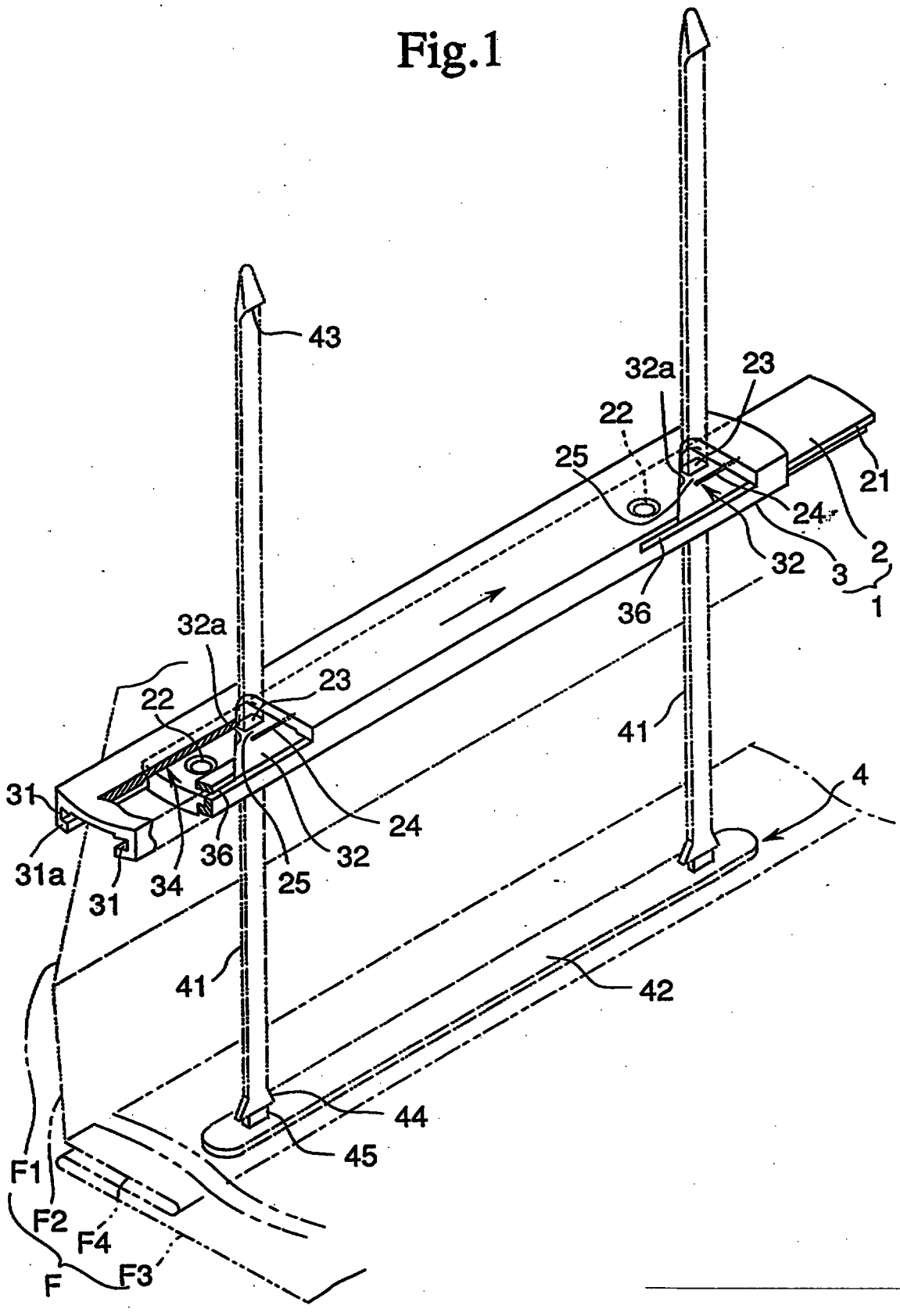
ABSTRACT OF THE INVENTION

A device for binding documents and the like comprises an elongated guide member provided with a plurality of holes through which binding prongs are to be passed; and a fastener combined with said guide member in such a manner that said fastener is slidable longitudinally relative to said guide member thereby to fasten said prongs passed through said holes to a binding position; whereby said prongs passed through said holes in said guide member are bent at the same time by sliding said fastener relative to said guide member so as to be engaged by said fastener.

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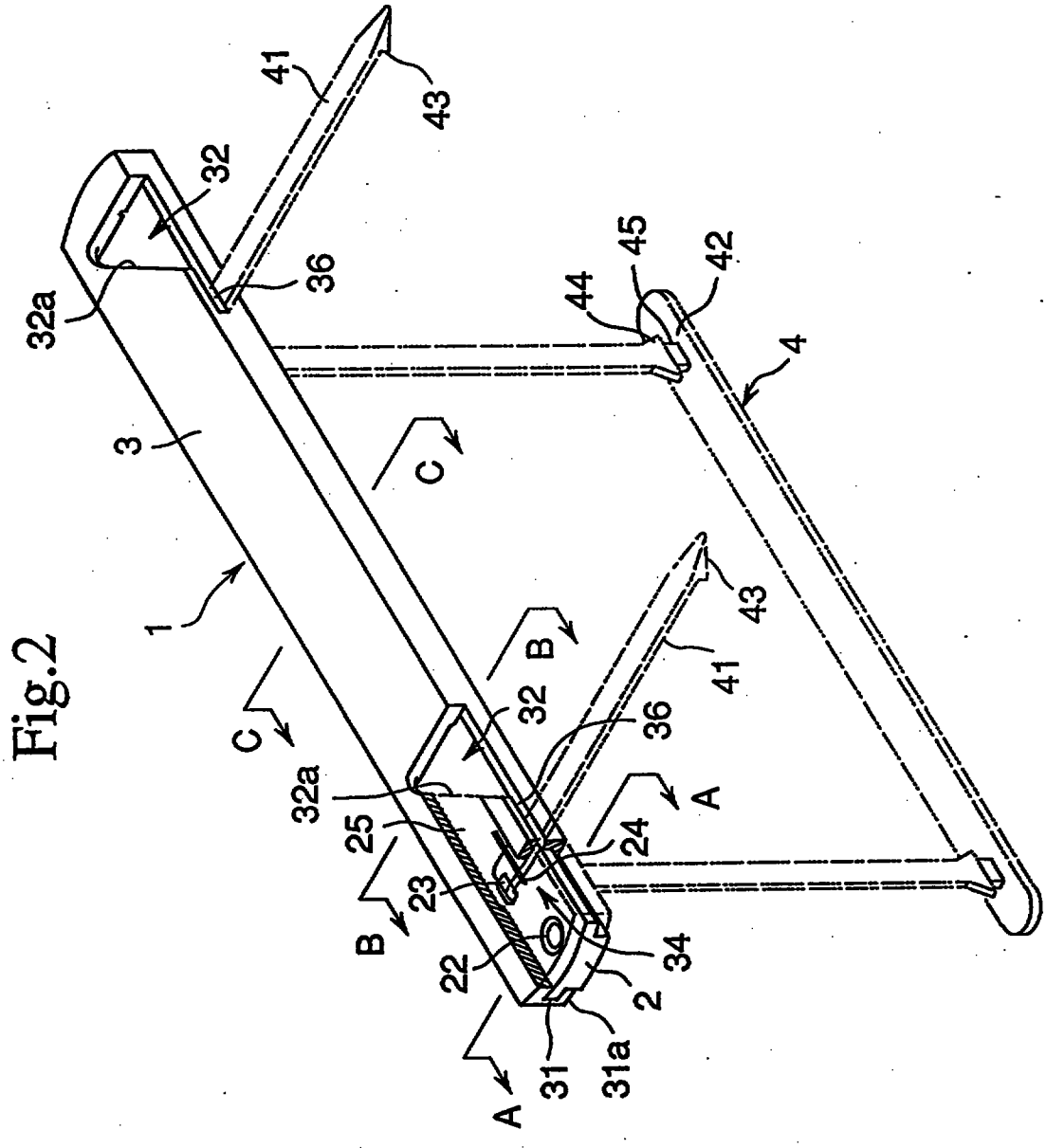


Fig.1



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Fig.2



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Fig.3

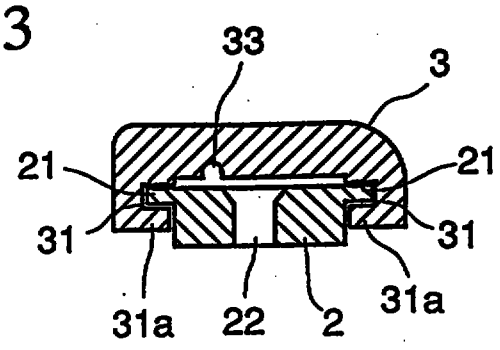


Fig.4

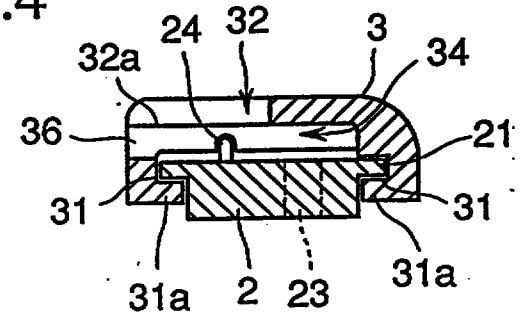
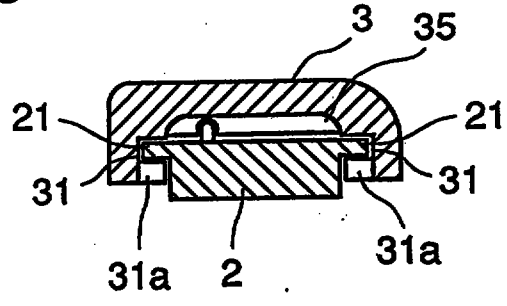
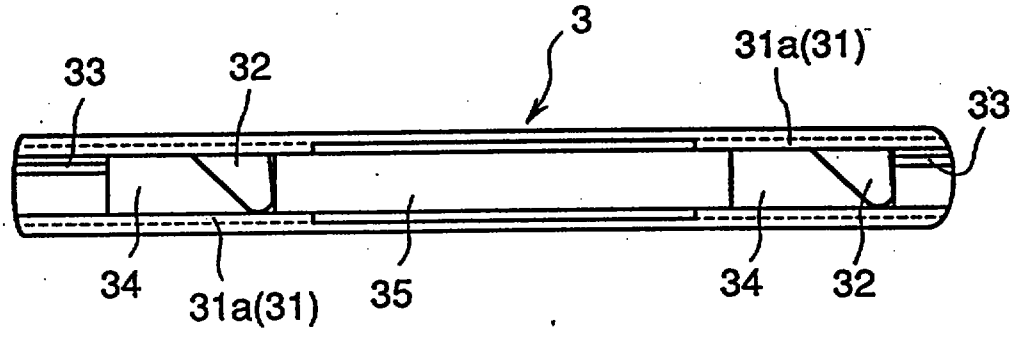


Fig.5



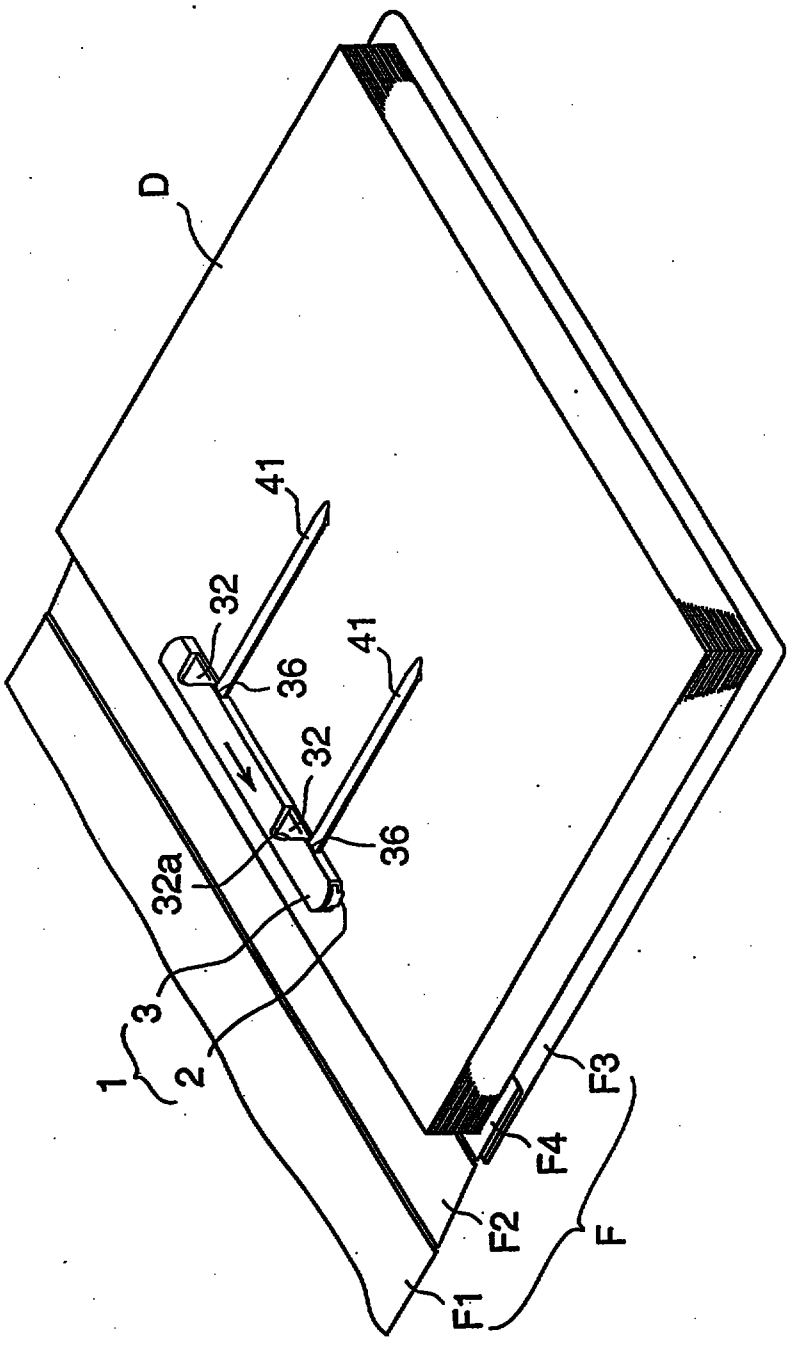
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Fig.6



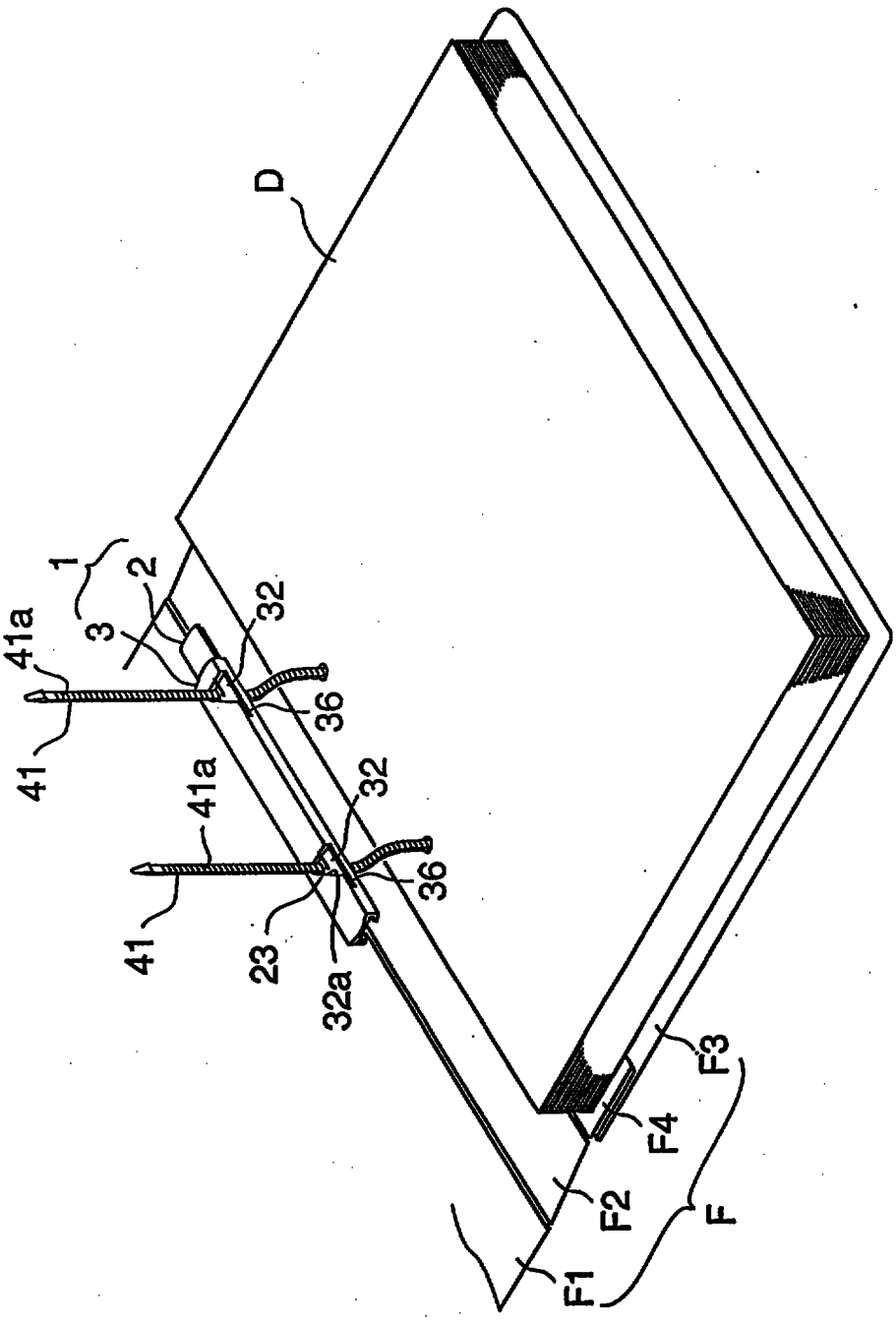
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Fig.7



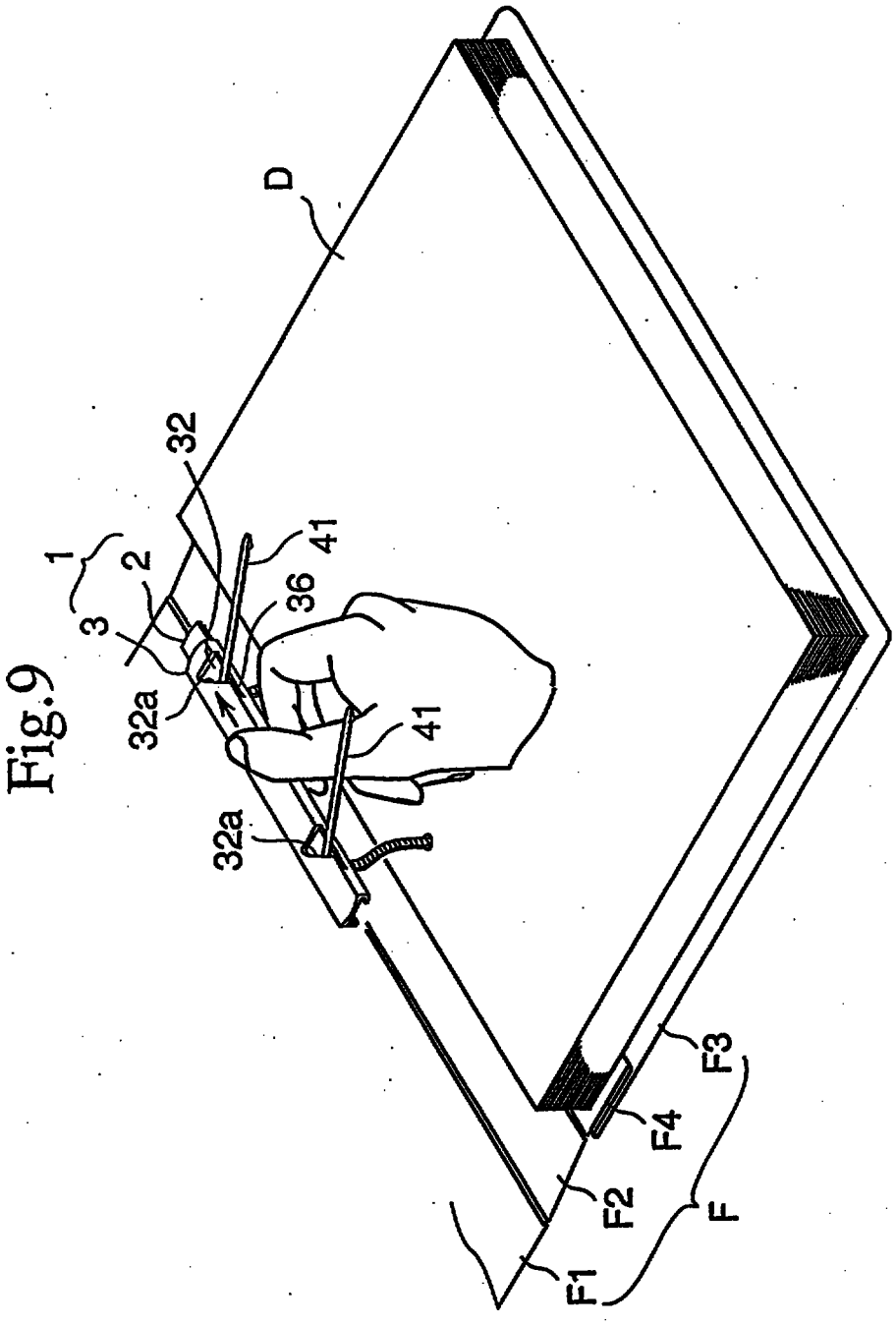
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Fig.8



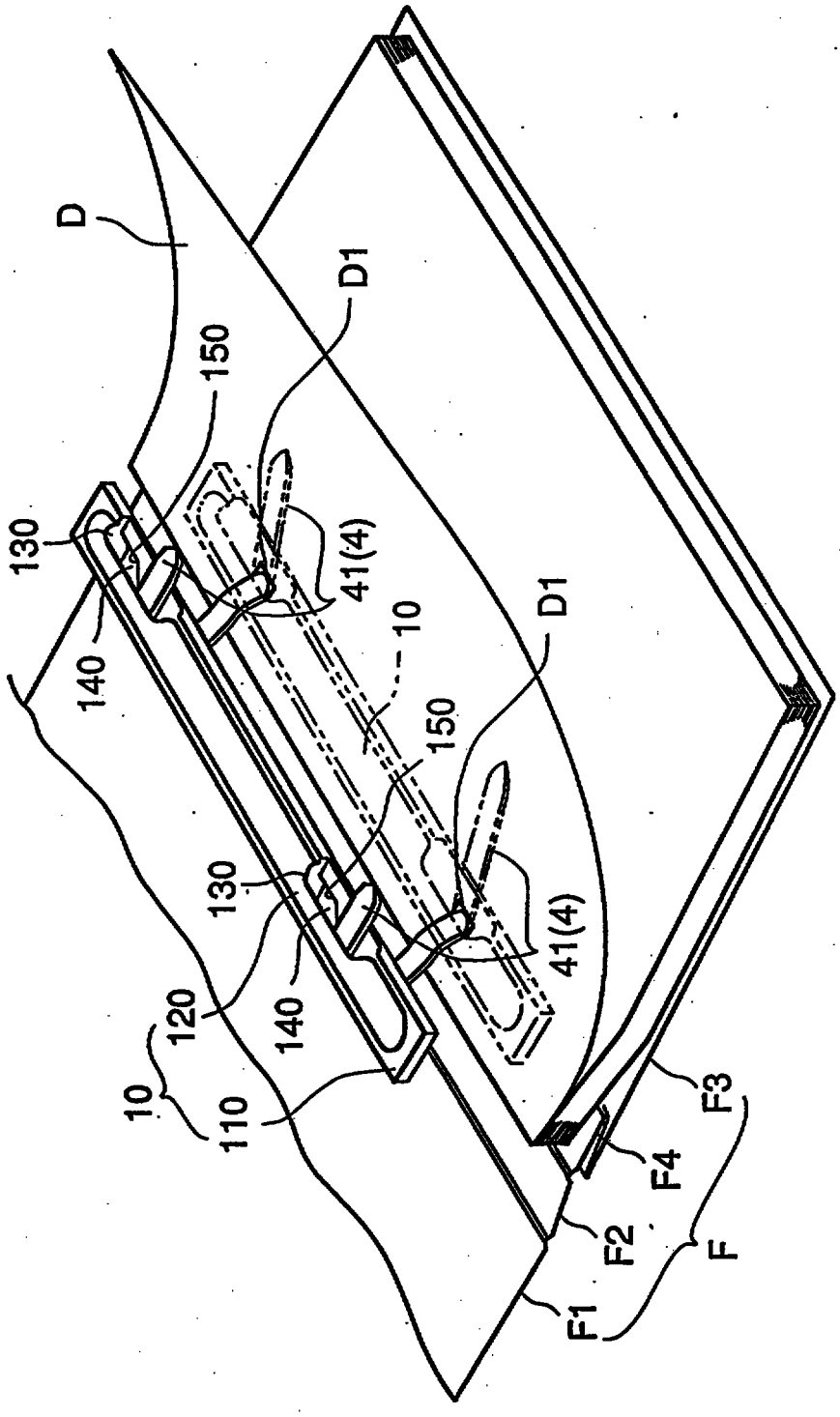
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Fig.9



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Fig.10



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DESCRIPTION

DEVICE FOR BINDING DOCUMENTS AND THE LIKE

TECHNICAL FIELD

This invention relates to a device for binding sheets of paper such as documents in a file folder.

BACKGROUND ART

Fig. 10 shows a binder 10 of this type disclosed in Japanese Utility Model Publication No. 5-5022. The binder 10 is used with a file cover F, which comprises a front cover portion F1, a spine strip F2, and a rear cover portion F3, a portion of which adjoining the spine strip F2 is folded to form a folded cover potion F4, to which a prong means 4 is attached. The prong means 4 comprises a pair of binding prongs 41, which are passed through the folded cover portion F4.

The binder further comprises an elongated pressing plate 110, which is provided on its upper face with an upwardly bulged wall 120 extending longitudinally of the plate 110. The bulged wall 120 is provided at the front side thereof (which is directed to the lower right in the figure) with a pair of windows 130 spaced apart from each other longitudinally of the plate 110, through which a pair of binding prongs 41 are to be drawn out. Each of the windows 130 communicates through a cavity 140 formed in the plate 110 with a hole 150 formed in the bottom of the plate 110, through which one of the prongs 41 is to be introduced into the cavity 140. The prongs 41 are flat strips of resiliently flexible material having a width and the holes

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150 have such a length (longitudinally of the plate 110) greater than the width of the prongs 41 that the prongs 41 are inserted through the holes 150. Each of the holes 150 has one half portion (at the upper right side in the figure) of a width (perpendicular to the length of the plate 110) greater than the other half portion, which is gradually displaced from the front edge of the plate 110 and becomes narrower toward the other (lower left) end.

The binding prongs 41 are passed through a pair of holes D1 formed in one side portion of the documents D to be bound and further through the windows 130. Then the pressing plate 110 is pressed on the documents D and then slid thereon in the upper right direction in the figure thereby to fix the prongs 41 between the ceilings of the cavities 140 and the upper surface of the pressing plate 110, whereupon the documents D are bound by the binder 10 as illustrated by imaginary lines in Fig. 10.

When the bound documents are to be opened, the pressing plate 110 is slid from the position indicated by imaginary lines toward the lower left thereby to release the prongs from engagement with the plate 110. Then the plate 110 is raised and while it is held by one hand, the outer end portion of each of the prongs 41 is moved by the other hand into engagement in a gap between the ceiling of each of the cavities 140 and the upper surface of the pressing plate 110 as indicated by real lines in Fig. 10, whereupon the plate 110 is fixed to the outer end portions of the prongs 41. Under the condition, by moving some of

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the documents D to those portions of the prongs which are exposed below the pressing plate 110 it is possible to turn the pages with ease.

In the known arrangements, however, it is necessary to hold the binder 10 above the bound documents by one hand and move by the other hand the prongs 41 one by one to the left side of each of the cavities 140. in other words, both hands must be used to engage the binder 10 held above the documents with the outer end portions of the prongs 41. This is quite inconvenient.

On the other hand, by sliding the pressing plate 110 in contact with the documents D in the upper right direction as shown by imaginary lines it is possible to bring the prongs 41 simultaneously into engagement with the plate 110.

However, if a large stack of documents are to be bound, friction between the under surface of the plate 110 and the upper surface of the stack causes some of the documents in the upper portion of the stack to follow the plate 110 as it is slid to the upper right so that the stack of documents would be deformed into a parallelepiped. As a result, an extraordinary force is applied to the holes D1 in the documents D through which the binding prongs 41 are inserted thereby to damage the edges of the holes. The prongs 41 of this type used in the binder are usually in the form of long, narrow strips having lateral edges, which act like a knife edge to cut the peripheries of the holes in the bound documents as the documents are caused to slide

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relative to the prongs in the above-mentioned manner.

DISCLOSURE OF THE INVENTION

This invention has been accomplished to solve the above problems and has its object the provision of a binder in which the operation of bringing the binding prongs into and out of engagement with a fastener can be performed with a single hand without causing any damaging force to be applied to the documents to be bound even when the fastener is in contact with or near he documents as it is operated.

The device of the invention comprises an elongated, rectangular guide member provided with holes for a plurality of binding prongs to be inserted through, and a fastening member combined with the guide member slidably along the length thereof, whereby the prongs passed through the holes in the guide member can be bent into a fastened position at the same time by sliding the fastener relative to the guide member.

In a preferred embodiment of the invention, the fastener is provided with a pair of windows through which the binding prongs are to be passed and a pair of slits each communicating with one of the windows. Each of the windows is provided with an obliquely extending guide edge for helping bend each of the prongs inserted through the windows as the fastener is slid relative to the guide member and guiding each of the bent prongs into the corresponding one of the slits.

With the binder of the above-mentioned structure, by fixing the binding prongs to a file cover and inserting the

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prongs through the holes formed in the guide member it is possible to fix the guide member to the file cover, and by sliding the fastener mounted on the guide member longitudinally thereof it is possible to bent the prongs at the same time into engagement with the fastener. By sliding the fastener in the opposite direction it is possible to release the prongs from the fastener.

In particular, with the guide member and the fastener being held between the thumb and forefinger of one hand, by moving the two fingers in opposite directions it is possible to slide the fastener relative to the guide member thereby to cause the prongs inserted through the holes in the guide member and the windows in the fastener to be bent by the obliquely extending edges of the windows and guided into the slits associated with the windows to be securely held therein.

With the binder of this invention, by a simple operation with a single hand it is possible to raise the fastener above the bound documents and fix it to the prongs at a position of a desired height, thereby to leave a sufficient length of each of the prongs exposed above the documents and below the fastener to make turning of the pages of the documents easy. It is also possible to change the above length of the prongs to be left exposed with ease and without using both hands.

Even when the fastener is in close contact with the documents, it is also possible to operate the fastener without causing an extraordinary force to be applied to the

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documents. In particular, the fastener can be slid relative to the guide member even when the member is kept stationary in close contact with the documents. Under the condition, with the guide member on the documents being held by a finger, the fastener can be slid into engagement with the prongs by another finger without causing any frictional force to act on the documents in the facial direction thereof while effectively preventing distortion of the stacked documents to damage the holes therein through which the prongs are passed. The binder of the invention has a particular advantage when a large stack of documents is to be bound.

The guide member and the fastener are combined in such a manner that the two members are slidable longitudinally relative to each other. To this end, either one of the two members are provided on each of the opposite lateral sides thereof with a guide rail extending the whole length of the member while the other member is provided with corresponding grooves, which the rails slidably engage so that the two members can slide relative to each other.

In order to enable smooth fastening of the binding prongs by a simple mechanism, the fastener is provided with a pair of right-angled triangular windows, the oblique side of each of which is to be used as the previously mentioned oblique guide edge.

To make the fastening of the prongs securer, between the fastener and the upper surface of the guide member there may be formed a space for accommodating the bent

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portion of each of the binding prongs, and on the surface of the guide member there may advantageously be formed a projection for engaging the bent portion of the prong within the space.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a partly cut-out perspective view of a binding device embodying the invention, shown in its operative condition to bind documents or sheets of paper to a file folder; Fig. 2 is a perspective view of the binder of Fig. 1 shown in a different operative position in which binding has been completed; Fig. 3 is a sectional view taken along line A-A of Fig. 2; Fig. 4 is a sectional view taken along line B-B of Fig. 2; Fig. 5 is a sectional view taken along line C-C of Fig. 2; Fig. 6 is a bottom view of a fastener for securing binding prongs; Fig. 7 is a perspective view showing documents bound by the device of the invention; Fig. 8 is a perspective view showing the fastener raised along the prongs above the documents; Fig. 9 is a perspective view showing the fastener operated by one hand in a single action; and Fig. 10 is a perspective view of a conventional binder.

BEST MODE OF EMBODYING THE INVENTION

Fig. 1 is a partly cut-out perspective view showing a binding device in accordance with a preferred embodiment of this invention and which shows a pre-step to bind a stack of documents. Fig. 2 is a perspective view of the binder of Fig. 1 shown in a different operative position in which binding has been completed. Fig. 3 is a sectional view

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taken along line A-A of Fig. 2, Fig. 4 is a sectional view taken along line B-B of Fig. 2, and Fig. 5 is a sectional view taken along line C-C of Fig. 2. Fig. 6 is a bottom view of a fastener for securing binding prongs which constitute a binding device.

As shown in Fig. 1, the binding device 1 in accordance with the invention comprises an elongated guide member 2 and a fastener 3 guided by and longitudinally slidable on the guide member 2. The device 1 further comprises a prong means 4 to bind documents D in a file folder. The binder of the invention can be used to bind not only documents but also other various kinds of sheets of paper such as drawing sheets, photograph mounts, scraps from newspapers or magazines, setting boards for botanical specimens, various types of slips, etc.

The prong means 4 comprises an elongated base plate 42 provided near the opposite ends thereof with a pair of binding prongs 41 made of a flat strip of resiliently flexible material and extending in the same plane from the same surface of the plate 42 perpendicularly thereto. Each of the prongs 41 has an outer end portion tapered toward a free end, which is thickened on one of its flat lateral surfaces to form a catch hook 43. Each of the prongs 41 is provided at its opposite lateral sides adjacent its lower end with a lower hook 44, which defines a relatively constricted end portion 45 between the hook 44 and the upper surface of the base plate 42.

A file folder F comprises a front cover F1, a spine

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strip F2, a rear cover F3 and a folded double-layer portion F4 formed by folding a lateral portion of the rear cover F3 adjacent the spine strip F2 into the double-layer portion F4. The prong means 4 is fixed to the folder F by passing the prongs 41 through holes formed in the folded cover portion F4 from its underside, with the relatively constricted portions 45 of the prongs 41 occupying the holes and the lower hooks 44 preventing the prongs 41 from falling off therefrom.

The prong means 4 is made of a synthetic resin, and the prongs 41 and the base plate 42 are molded integrally into a single member by injection molding. As the synthetic resin that can be used, polyvinyl chloride, polyethylene, polypropylene, etc. are preferred. Any other suitable materials, if flexible, may also be used.

In the illustrated embodiment, the binding prong means 4 is composed of the binding prongs 41 and the base plate 42. It is not restricted to the illustrated shape and structure, but the whole of the prong means may be composed of a single strap or string. The base plate 42 may be omitted, and the binding prongs 42 alone may be fixed directly to the folded cover portion F4 of the folder F.

The guide member 2 consists of an elongated plate made of a relatively rigid suitable material such as a hard synthetic resin. The upper portion of each of the opposite lateral sides of the guide member 2 is formed into a laterally projecting guide rail 21 running the whole length of the guide member 2. The guide member 2 is provided with

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a pair of holes 22, one of which is formed adjacent one end (the left end in the figure) of the member while the other is spaced a distance from the opposite end (the right end in the figure) of the member toward the center thereof. The hole 22 are provided to fix the guide member 2 to a part of the file folder F, and can be omitted if the guide member 2 is not to be fixed to the folder F.

In the guide member 2, adjacent the above-mentioned holes 22 toward the right thereof and on that lateral side of the longitudinal center line of the member 2 which is adjacent the spine strip F2 of the folder F, there are formed another pair of holes 23 through which the binding prongs 41 are to be inserted. The distance between the two holes 23 is substantially equal to that between the two binding prongs 41. On the upper surface of the guide member 2 at the lateral side of each of the holes 23 remote from the spine strip F2 of the folder F there is formed an engaging projection 24 extending longitudinally of the member 2 a distance slightly longer than the longitudinal dimension of the holes 23.

The fastener 3 is an elongated member of a suitable material shaped like the letter of C in transverse section with its opening facing downward. In the opposite lateral inner surfaces of the elongated member of the fastener 3, a pair of longitudinally extending guide grooves 31 complementary to the previously described guide rails 21 of the guide member 2 are formed defining a pair of longitudinally extending banks or shelves 31a. With the

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rails 21 complementarily engaging the grooves 31, the fastener 3 is longitudinally slidable along the rails 2.

In the opposite end portions of the upper wall of the fastener 3 there are formed a pair of right-angled triangular windows 32 each having an oblique side positioned at the left and one of the other two sides open in the lateral or front wall of the member 3 toward the documents to be bound. The windows 32 are formed in correspondence to the holes 23 in the guide member 2 at such positions that with the fastener 3 slid leftward a short distance relative to the guide member 2, the portions adjacent the vertices of the triangles of the windows 32 coincide with the holes 23 in the guide member 2.

In the above-mentioned lateral or front wall of the fastener 3 there is formed a slit 36 extending leftward from the previously mentioned one open side of the triangle of each of the windows 32. The slits 36 are formed in correspondence to the holes 23 in the guide member 2 at such positions that with the guide member 2 completely contained in the fastener 3 as shown in Fig. 2, the slits 36 in the fastener 3 are laterally aligned with the holes 23 in the guide member 2. With the binding prongs 41 inserted through the holes 23 in the guide member 2 and the windows 32 in the fastener 3 as shown in Fig. 1, as the fastener 3 is slid on the guide 2 toward the right in the figure, the oblique sides 32a of the triangular windows 32 bend the prongs 41 forwardly and guide them into the slits 36 as shown in Fig. 2, wherein those portions of the upper

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wall of the fastener 3 at the left side adjacent the oblique sides of the windows 32 completely cover the holes 23 of the guide member 2.

In the inner surface of the top wall of the fastener 3 at the opposite longitudinal ends thereof, there are formed a pair of grooves 33 in correspondence to the linear engaging projections 24 on the upper surface of the guide member 2 so that as the two members 2 and 3 are slid relative to each other, the projections 24 engage the grooves 33 thereby to prevent mutual interference between the ceiling of the member 3 and the projections 24.

As shown in Figs. 4 and 6, below each of the windows 32 and communicating therewith there is formed a cavity or space 34 for accommodating the binding prong 41 which covers the hole 23 and the linear projection 24 under the condition that the fastener 3 is displaced relative to the guide 2 as shown in Fig. 1 and also under the condition that the guide 2 is completely contained in the fastener 3 as shown in Fig. 2. As shown in Figs. 5 and 6, between the right and left cavities 34 there is formed a relatively large cavity 35 having a ceiling a little higher than the upper surface of the guide member 2. The previously mentioned banks or shelves 31a defining the grooves 31 do not extend along the cavity 35.

The guide member 2 and the fastener 3 are made of a suitable hard synthetic resin by injection molding. The resin may be selected from hard polyethylene, hard polypropylene, polyvinyl chloride, polystyrene,

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acrylonitrile styrene, acrylonitrile butadiene styrene, polymethyl metacrylate, polyvinylidene chloride, polyethylene terephthalate, polyamide, polyacetal, polycarbonate, polybuthylene terephthalate, etc. Any other materials having suitable hardness and rigidity may also be used.

The device of the invention is used to bind documents D in the following manner. As shown in Fig. 1, the fastener 3 is slid on the guide member 2 so that the holes 23 in the member 2 coincide with and are exposed in the windows 32. The binding prongs 41 that have been passed through perforations in the documents D are inserted upward through the holes 23 and the windows 32 from the underside of the guide member 2 so that the upper portions of the prongs stand upright above the fastener 3.

Then as the fastener 3 is slid on the guide member 2 to the upper right in Fig. 2, the oblique sides of the windows 32 push and bend the prongs 41 laterally or substantially perpendicularly to the longitudinal direction of the fastener 3 and the guide member 2 until the prongs 41 are introduced into the slits 36 from within the windows 32 and lie flat on the documents D that have just been bound by the device.

Under the condition that the fastener 3 has completely coincided with the guide member 2, the prongs 41 laterally project from the slits 36 of the windows 32 of the fastener 3 so as to lie on the documents D, with the projections 24 on the upper surface of the guide member 2 engaging the

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step-like projections 41a formed on that lateral surface of each of the prongs 41 which faces downward, thereby preventing the prongs 41 from being pulled out of the fastener 3 even when a force is applied to the documents D to remove them from the binding device.

The above state is shown in Fig. 7, wherein the documents D placed on the inner surface of the rear cover F3 of the folder F are bound by the prongs 41 fixed to the folded portion F4 of the folder and pressed and held by the device within the folder, the outer bent portions of the prongs lying on the documents D.

In order to make it easy to turn the pages of the bound documents D and have the documents kept open stably at a desired page, the fastener 3 is slid to the lower left as shown by an arrow in Fig. 7 as far as the holes 23 in the guide member 2 come to be exposed through the windows 32 so that the prongs 41 are released from the engagement with the fastener 3, whereupon the fastener 3 is raised a little above the documents D as shown in Fig. 8. Then the fastener 3 is again slid to the upper right so as to engage the prongs 41 again so that the fastener 3 will not be slipped out therefrom. Under the condition, the pages of the documents D can be turned with ease, and the documents D can be kept open stably.

Since the device 1 of the invention is composed of the guide member 2 and the fastener 3 combined with and slidable on the guide member 2, the operation of sliding the fastener 3 relative to the guide member 2 raised above

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the documents can be conducted in a single action by holding the device by one hand and sliding the fastener to the upper right by the thumb relative to the guide member 2 held by the forefinger as shown in Fig. 9. Reversely, by sliding the fastener 3 to the lower left by the thumb it is possible to release the prongs 41 from the engagement with the fastener 3 by a single operation.

In the illustrated embodiment, the fastener 3 is provided with the pair of right and left windows 32, through which the binding prongs 41 project upward. Instead of the windows, the fastener 3 may be provided with a space like the space 35 at the same side of and communicating with each of the spaces 34 for introducing the prongs, so that the prongs inserted through the holes 23 in the guide member 2 into the spaces 34 may be introduced into the respective adjoining spaces. In this arrangement, when the documents D have been bound to the rear cover F2, the prongs 41 do not project from on the surface of the fastener so that the folder F with the binder 1 affixed thereto may have a good appearance.

POSSIBILITY OF USE IN INDUSTRY

The device for binding documents and the like in accordance with invention is suitable for binding a stack of papers, photograph mounts, or catalogue or the like.

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CLAIMS

1. A device for binding documents and the like comprising: an elongated guide member provided with a plurality of holes through which binding prongs are to be passed; a fastener combined with said guide member in such a manner that said fastener is slidable longitudinally relative to said guide member thereby to fasten said prongs passed through said holes to a binding position; whereby said prongs passed through said holes in said guide member are bent at the same time by sliding said fastener relative to said guide member so as to be engaged by said fastener.

2. A device for binding documents and the like comprising; an elongated guide member provided with a plurality of holes through which binding prongs are to be passed; a fastener combined with said guide member in such a manner that said fastener is slidable longitudinally relative to said guide member thereby to fasten said prongs passed through said holes to a binding position; wherein said fastener is provided with; a plurality of windows through each of which one of said prongs is to be passed; and a plurality of slits each continuous from one of said windows for holding therein the bent portion of that one of said prongs which is passed through said one window; each of said windows being provided with an oblique edge for bending said one prong passed through said window and guiding said bent prong into the corresponding one of said slits to be held therein as said fastener is slid relative to said guide member.

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* C L M S *

3. The device as described in claim 1 or 2, wherein one of said guide member and said fastener is provided on each of the opposite lateral sides thereof with a rail extending longitudinally thereof, and the other of said guide member and said fastener is provided with corresponding grooves which said rails engage so that said guide member and said fastener are slidable relative to each other.

4. The device as described in claim 2, wherein said windows are shaped like a right-angled triangle in top plan view, one side of which constitutes said oblique guide edge.

5. The device as described in claim 2, wherein between said fastener and the upper surface of said guide member a space is provided for accommodating the bent portion of each of said prongs, and on the surface of said guide member a projection is provided for engaging the bent portion of said prong in each of said space.

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DEVICE FOR BINDING DOCUMENTS AND THE LIKE

ABSTRACT OF THE INVENTION

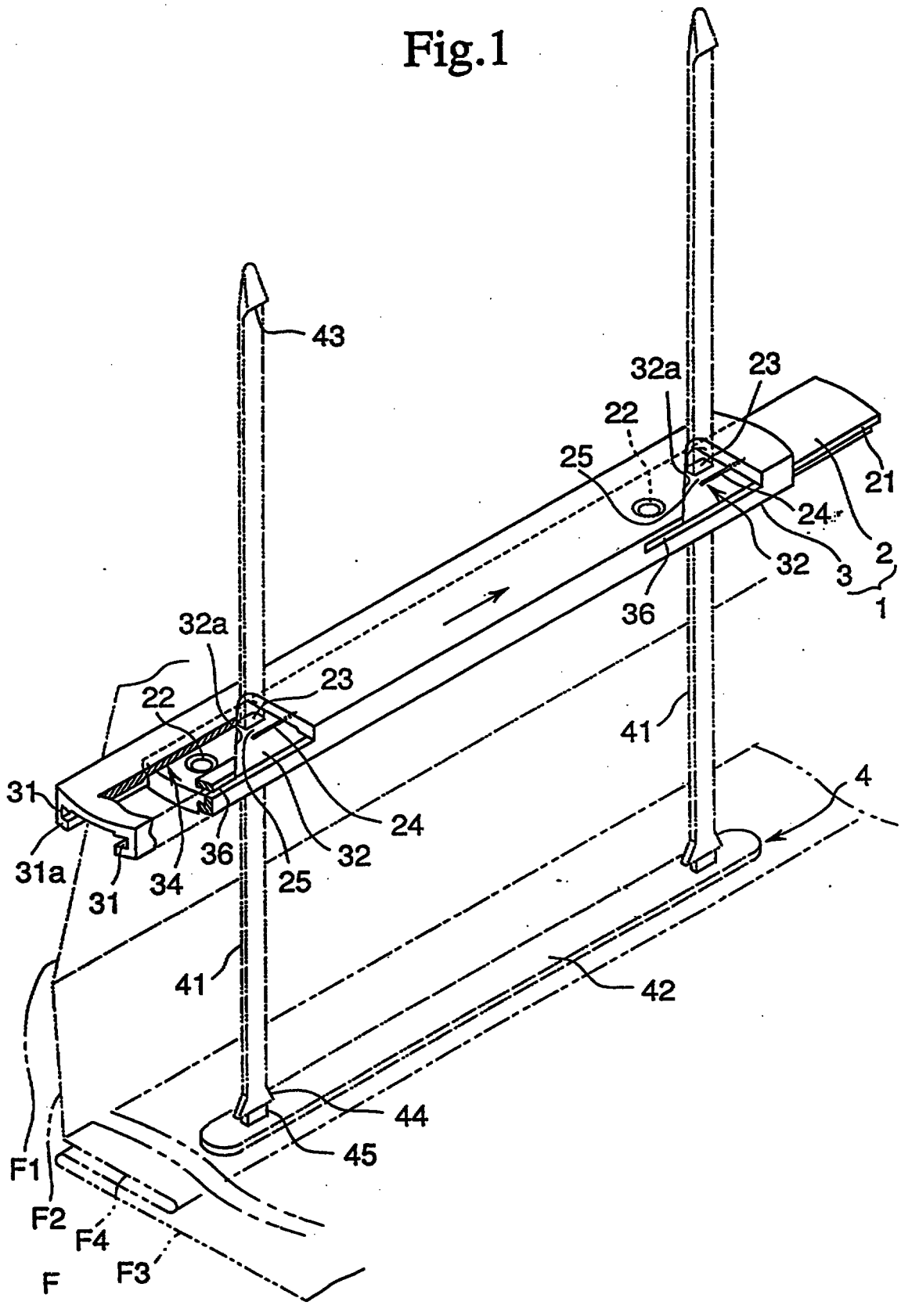
A device for binding documents and the like comprises an elongated guide member provided with a plurality of holes through which binding prongs are to be passed; and a fastener combined with said guide member in such a manner that said fastener is slidable longitudinally relative to said guide member thereby to fasten said prongs passed through said holes to a binding position; whereby said prongs passed through said holes in said guide member are bent at the same time by sliding said fastener relative to said guide member so as to be engaged by said fastener.

FIGURE 1.

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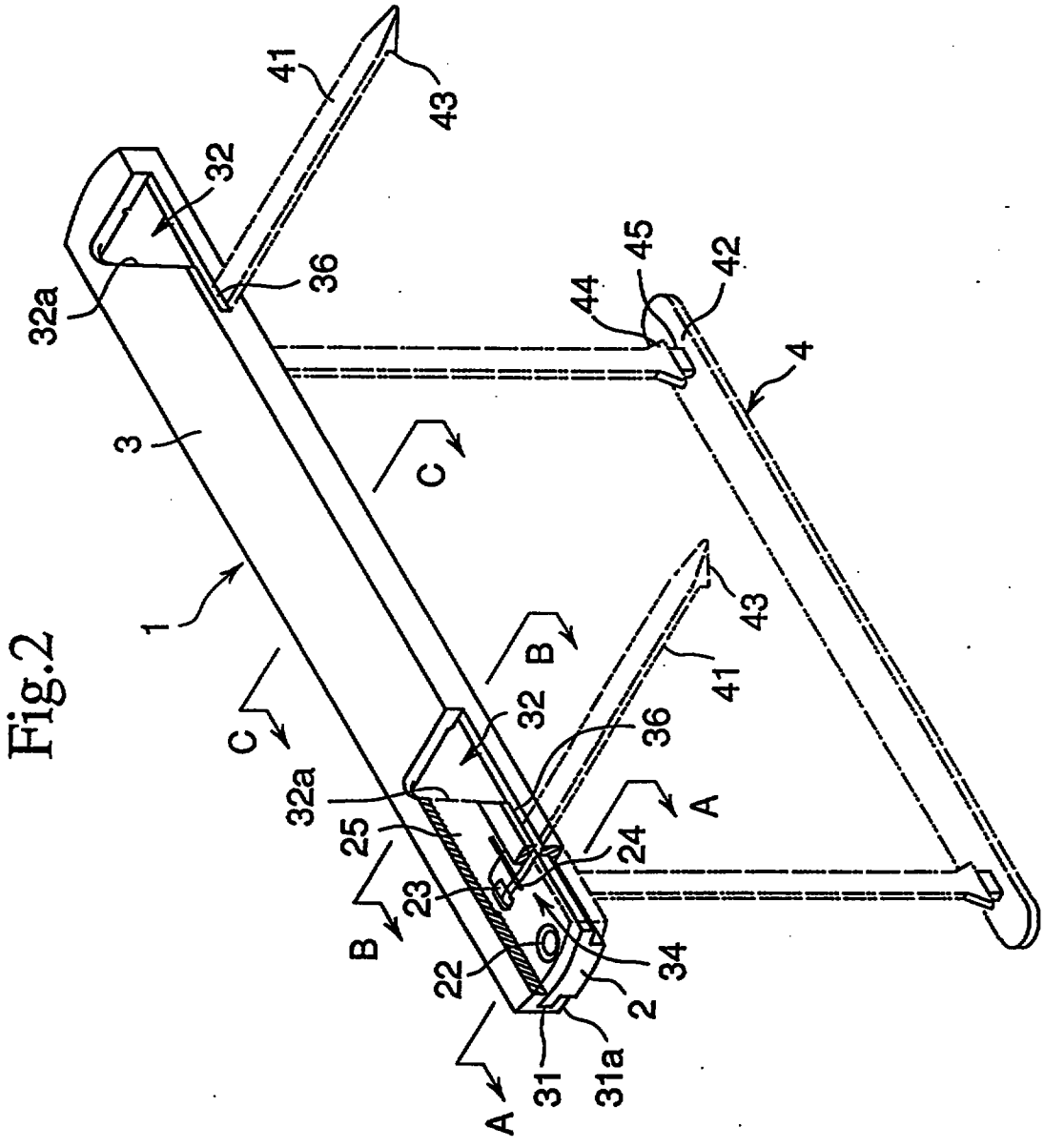
Fig.1



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Fig.2



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Fig.3

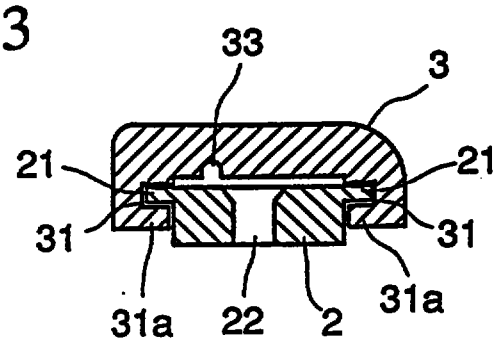


Fig.4

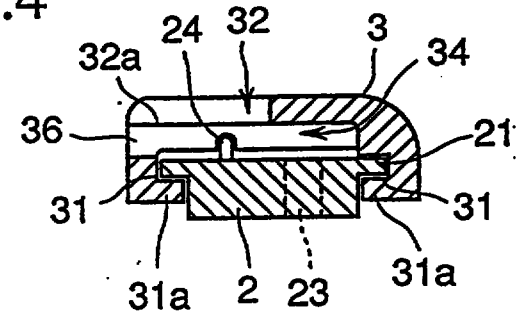
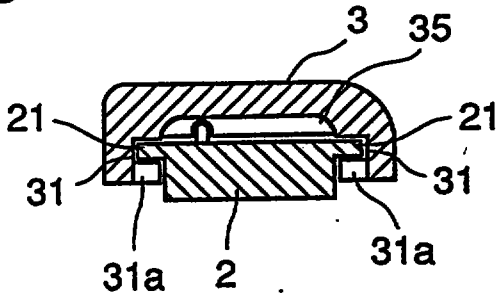


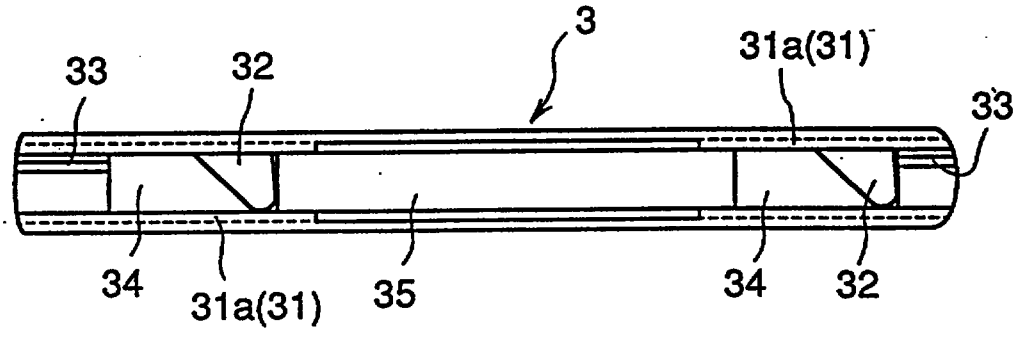
Fig.5



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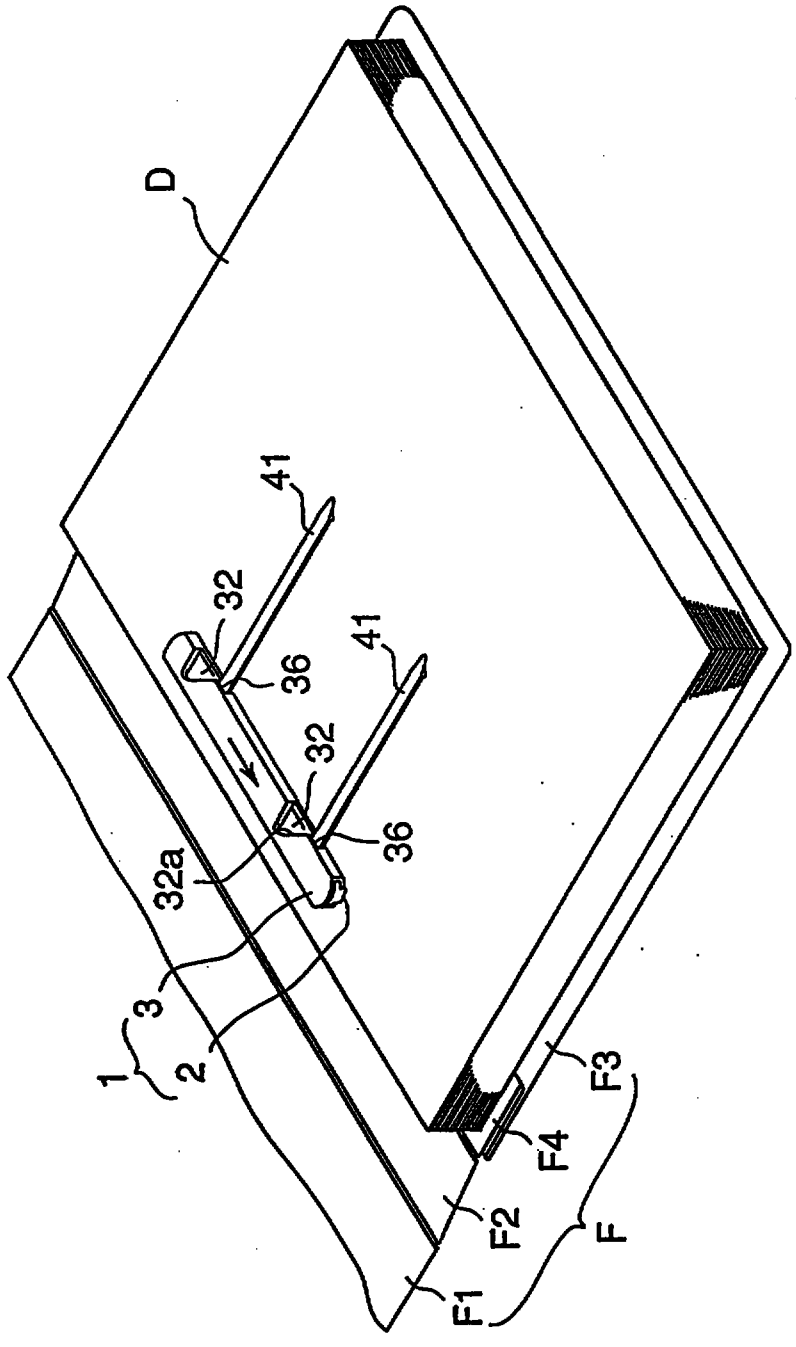
Fig.6



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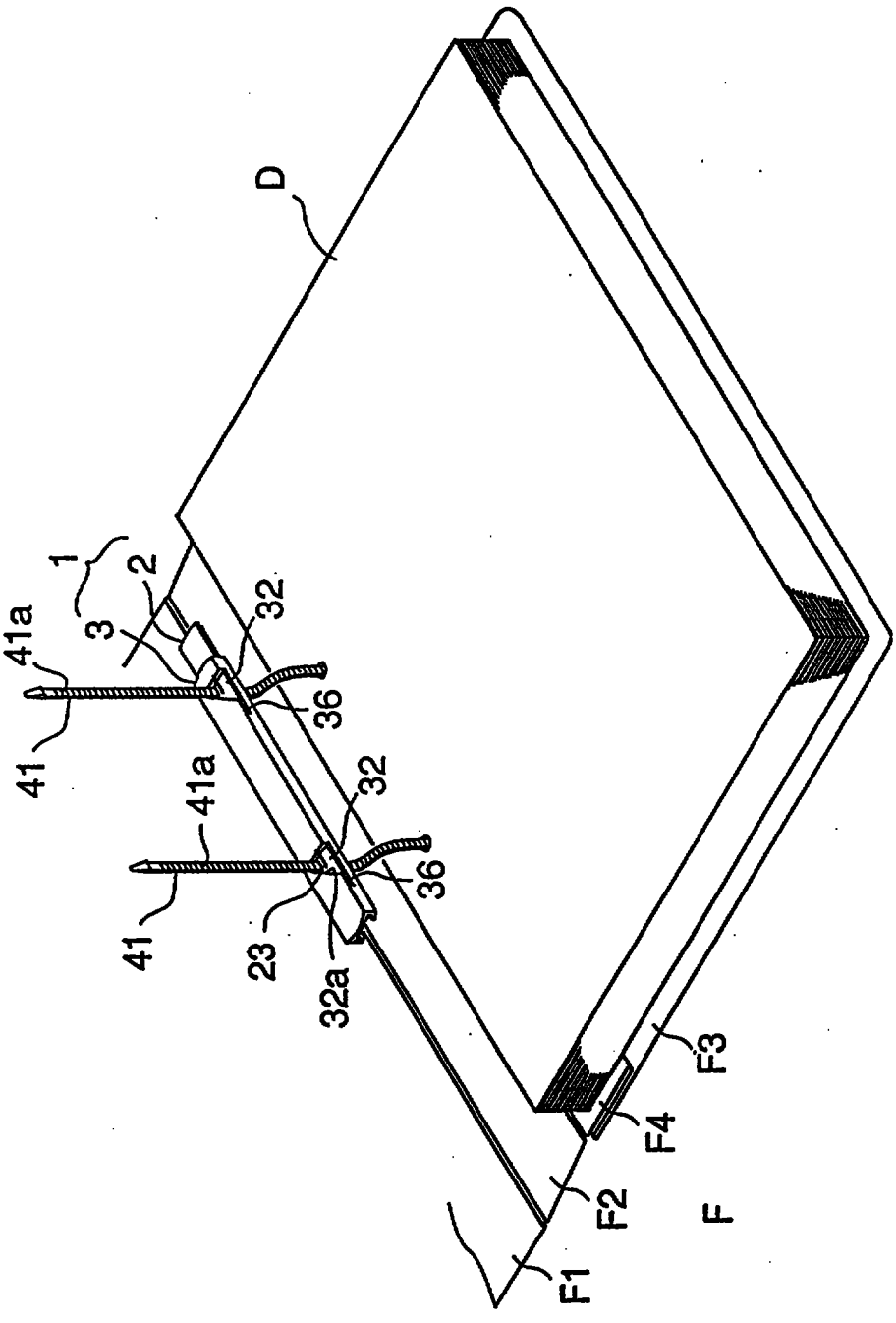
Fig.7



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Fig.8



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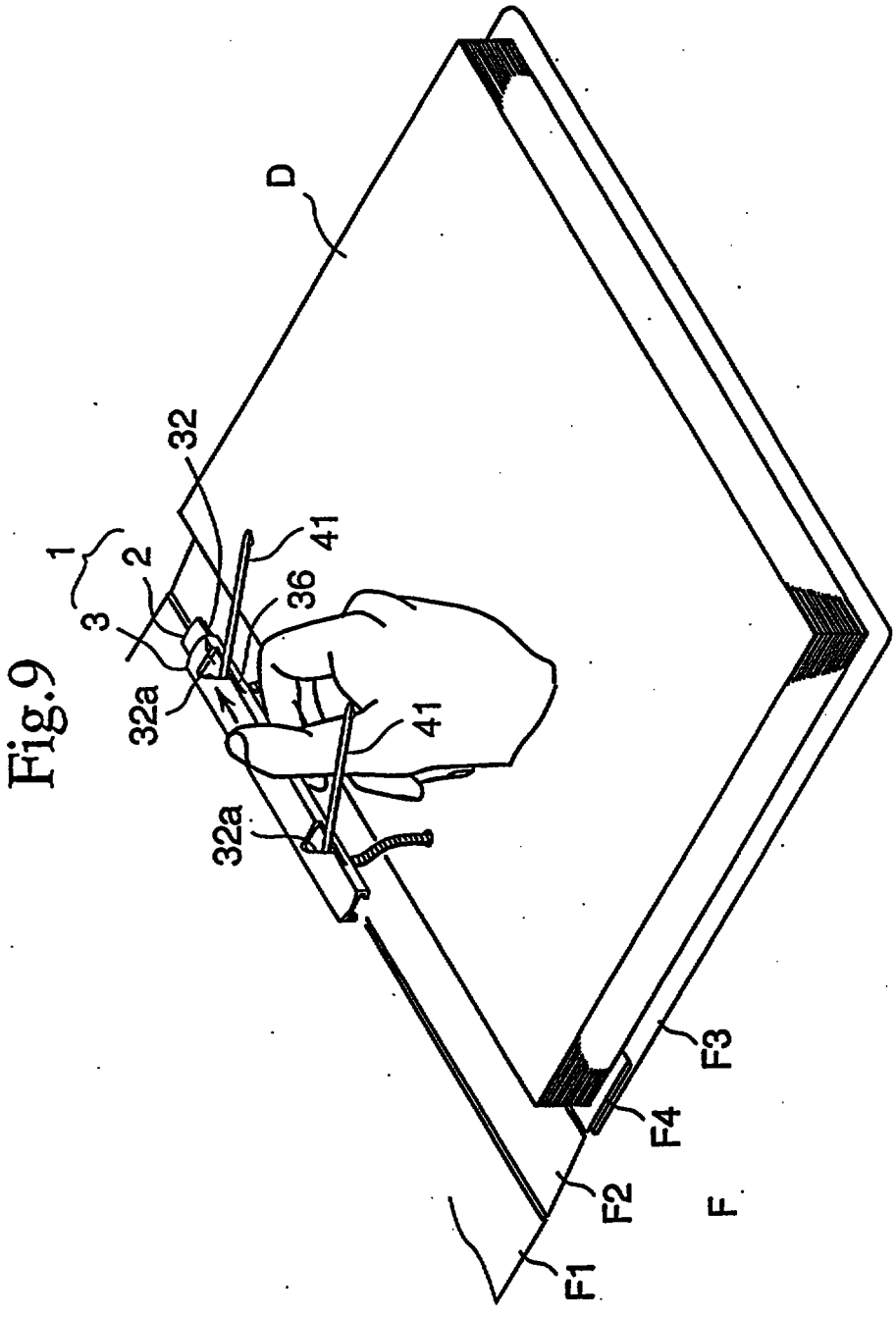
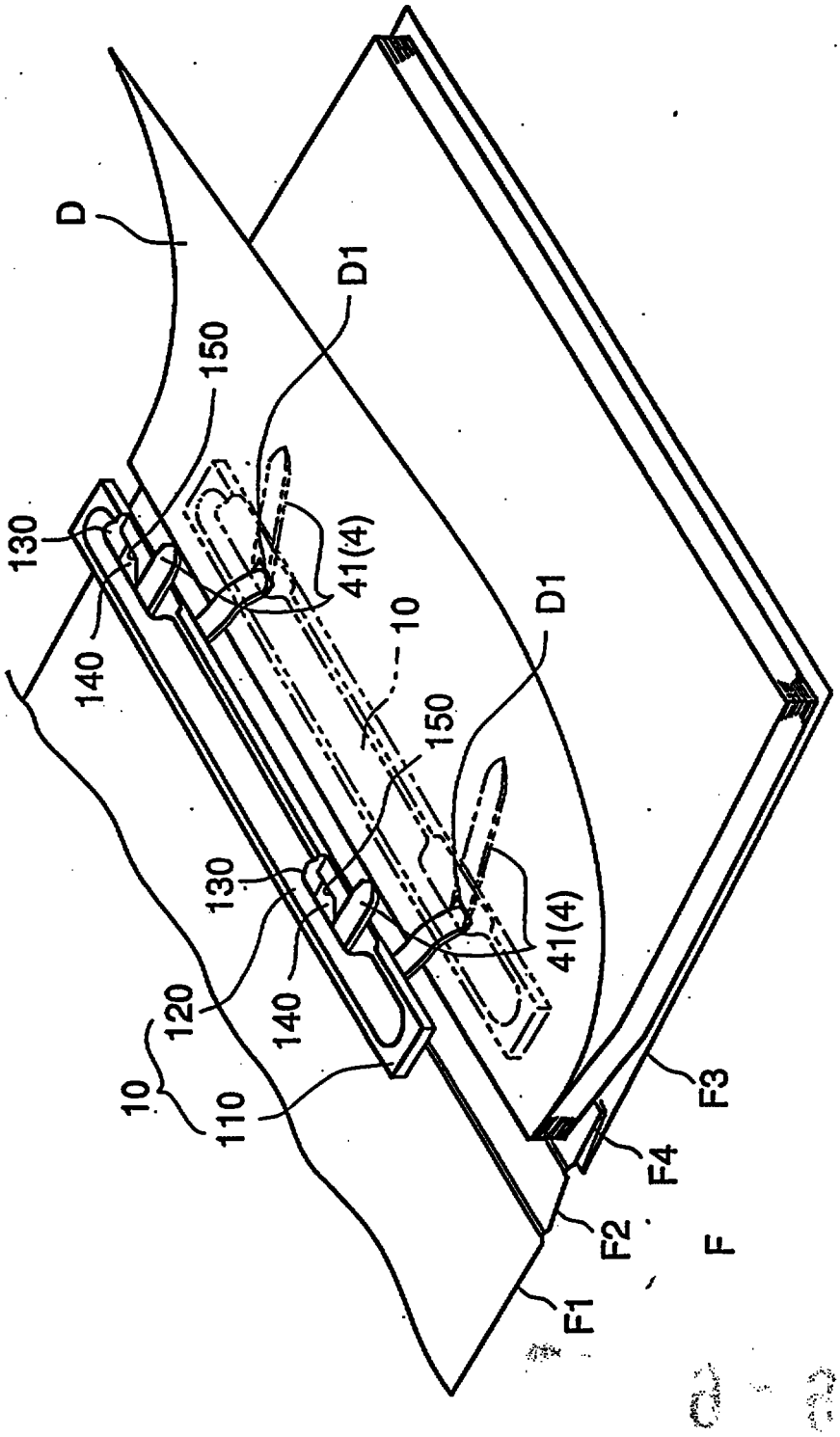


Fig.9

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Fig.10



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