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SPECIFICATIONS

Binding Member and File

FIELD OF THE ART

This invention relates to a binding member and a file comprising an operating lever that can be used preferably in an office or the like.

BACKGROUND ART

For example, as this kind of a binding member well-known is that comprises a pair of first binding members a, a and a pair of second binding members b, b corresponding to the first binding members a, a each of which is mounted on a base e, as shown in Fig. 15, wherein a bound state or a released state of papers or leaves can be realized by closing or opening a space between a distal end portion a1 of the first binding member a and a distal end portion b1 of the corresponding second binding member b through a relatively rotational movement of the first binding member a and the corresponding second binding member b. The binding member A comprises a release means c that applies a force toward a direction to open the space between the distal end portion a1 of the first binding member a and the distal end portion b1 of the corresponding second binding member b and an operating lever d that keeps the distal end portion a1 of the first binding member a and the distal end portion b1 of the corresponding second binding member b at a closed position by relatively rotating the first binding member a

and the corresponding second binding member b in the teeth of the release means c.

The binding member A is so arranged that the first and the second binding members a, b make a relatively rotational movement toward a direction to which a space between the distal end portions a1, b1 is closed in the teeth of a force applied by the release means c with an operation of the operating lever d downward so as to close the space between the distal end portions a1, b1 of the first and the second binding members a, b. Then the distal end portions a1, b1 of the first and the second binding members a, b make an abutting contact each other so that the space closes and the bound state of the papers or leaves can be kept by the first and the second binding members a, b under a keeping force by the operating lever d.

Meanwhile when the keeping force to keep the distal end portions a1, b1 of the first and the second binding members a, b at a closed position is released with an operation of the operating lever d upward, the first and the second binding members a, b make a relative movement to open the space between the distal end portions a1, b1 so as to make a transition to be in a released state due to a force to open the space between the distal end portions a1, b1 applied to the first and the second binding members a, b by the release means c.

Each of the distal end portions a1, b1 of the first and the second binding members a, b has a concave-convex arrangement to smoothly fit each other along a direction to

open or close as shown in Fig. 16 (a), and makes an abutting engagement each other so as to form an arch shape with the first and the second binding members a, b.

However, if an external force is accidentally applied to the first or the second binding member a, b due to drops of the binding member A or any other cause, since the distal end portions a1, b1 of the first and the second binding members a, b only make an abutting contact each other along a direction to close the space with a concave-convex engagement, it is very likely to temporarily form a gap between the distal end portions a1, b1 because of an elastic transformation toward a direction to open the space as shown in Fig. 16 (b) or to reclose the space incompletely in an improperly paired condition after the concave-convex engagement is released as shown in Fig. 16 (c) even though the operating lever d is in a closed position. As a result, there might be problems such that the papers or leaves get stuck between the distal end portions a1, b1, the papers or leaves drop out of the binding member A, the operating lever d can not be properly operated to open the space due to the improperly paired condition of the first and the second binding members a, b, or the space is not open due to a plastic transformation of the first or the second binding member a, b when the first and the second binding members a, b are in the improperly paired condition even though the operating lever d can properly be operated.

Especially, although the first and the second binding members a, b form an arch shape in a state the space is

closed, a substantial area to bind the papers or leaves is a rising portion of the second binding member b rising generally vertically from the base e and a top head portion T only serves as an area to pass the papers or leaves at a time to access contents of the papers or leaves or to add or remove papers or leaves. Then a distance between a proximal end portion a2 of the first binding member a to the distal end portion a1 thereof becomes long more than necessary due to the top head portion T, which tends to cause an elastic transformation when an external force is applied to a side of the distal end portions a1, b1, thereby to cause the above-mentioned problems more prominently.

In addition, if a file F is so arranged that the above-mentioned binding member A is mounted on a cover sheet body B, a dead space D is formed between a front cover sheet B1 and a rear cover sheet B2 as shown in Fig. 17 due to a shape of the top head portion T, thereby to drop an efficiency of storing papers or leaves or to increase an outer shape of the file F unnecessarily.

In order to solve the above problems the present claimed invention mainly intends to provide a binding member and a file wherein the papers or leaves can be prevented from getting stuck between the binding members or dropping out of the binding member and the operating lever can be properly operated in spite of an external force accidentally applied to circumference of the distal end portions of the first and the second binding members with the first and the second binding members kept in a closed position by the

operating lever.

DISCLOURE OF THE INVENTION

In order to attain the above object the present claimed invention has a following arrangement.

A binding member in accordance with the present claimed invention comprises a pair of first binding members and a pair of second binding members corresponding to the first binding members wherein a bound state or a released state of papers or leaves can be realized by closing or opening a space between a distal end portion of the first binding member and a distal end portion of the corresponding second binding member through a relatively rotational movement of the first binding member and the corresponding second binding member, and further comprises a release means that applies a force toward a direction to open the space between the distal end portion of the first binding member and the distal end portion of the corresponding second binding member and an operating lever that keeps the distal end portion of the first binding member and the distal end portion of the corresponding second binding member at a closed position by relatively rotating the first binding member and the corresponding second binding member in the teeth of the release means. In addition, the binding member is characterized by that between the distal end portions arranged is an engaging portion that engages the distal end portions of the first and the corresponding second binding members through a temporary elastic transformation of at

least either one of the first binding member and the corresponding second binding member and that prohibits the distal end portions from making a movement to open the space between the distal end portions by engaging the first and the corresponding second binding members further more tightly with making use of the force applied by the release means.

When the operating lever is operated toward a direction to close the space between the distal end portions of the first and the second binding member, both of the first and the second binding members make a relative rotational movement to a direction to close the space between the distal end portions in the teeth of the force applied by the release means. The engaging portion arranged between the distal end portions makes an engagement through the temporary elastic transformation of at least one of the first and the second binding members and a state in which papers or leaves are bound by the first and the second binding members can be obtained under a keeping force by the operating lever. The engaging portion is so arranged to make an engagement further more tightly by a force applied by the release means and the engaged state can not be released without a temporary elastic transformation of the first or the second binding member. This makes it possible to effectively prevent the first and the second binding members from making a transformation, resulting in closing the first and the second binding members again in the improperly paired condition even though the first and the second

binding members are likely to transform elastically toward a direction to open the space between the distal end portions because an external force is accidentally applied to the first or the second binding member due to drops of the binding member or any other cause.

If the operating lever is operated so as to release the keeping force to keep the space between the distal end portions of the first and the second binding members in a closed position and next the first binding member is elastically transformed temporarily by human, the engaging portion is released from engagement. Since a force toward a direction to open the space between the distal end portions is applied to the first and the second binding members by the release means, the first and the second binding members make a relatively rotational movement toward a direction to open the space between the distal end portions so as to obtain a released state of binding.

In accordance with this embodiment, it is possible to effectively prevent improper binding or dropping the papers or leaves or no-op of the operating lever by prohibiting the distal end portions of the first and the second binding members from making an elastic transformation toward a direction to open the space between the distal end portions, even though an external force is accidentally applied to the first or the second binding member due to drops of the binding member or any other cause. As a result of this, the binding member is solid against drop or accidental collision and reliability and durability as the binding member can be

effectively improved.

It is preferable that the engaging portion makes an engagement by making use of the temporary elastic transformation of the first binding members or the second binding members toward a direction to which a pair of the first binding members approach each other or a pair of the second binding members approach each other.

In accordance with the arrangement, the binding members can be elastically transformed toward a direction to approach each other with ease by pinching the first binding members with a finger or the like. As a result of this, it is possible to release a bound state of the first and the second binding members easily with a single hand.

It is also preferable that the engaging portion makes an engagement by making use of the temporary elastic transformation of the first binding members or the second binding members toward a direction to which the first binding members are separated from each other or the second binding members are separated from each other. In accordance with the arrangement, the binding members can be elastically transformed toward a direction to be separated from each other with ease by separating the second binding members with both hands. As a result of this, it is possible to release a bound state of the first and the second binding members easily with both hands even though the first and the second binding members are given a relatively high rigidity.

As a concrete arrangement of the engaging portion represented is that comprising an inward facing unciform

portion arranged at either one of the first binding member and the second binding member and an outward facing unciform portion arranged at the other binding member.

In accordance with the arrangement, it is possible to realize the engaging portion that engages smoothly with a closing movement and that engages further more tightly toward a direction to which the space between the distal end portions is open precisely with an easy processing or the like.

In order to further improve an effect and an operation of the present claimed invention it is preferable that each of the first binding member and the second binding member is so arranged to rise with a proximal end portion thereof mounted on a base and a top head portion extending generally parallel to the base is arranged on at least either one of the first binding member and the second binding member locating at a rising end side in a state the space is closed.

Since the top head portion extending generally parallel to the base is arranged at the rising side of at lease one of the first and the second binding members, a length from a proximal end portion of the binding member to a distal end portion thereof becomes small although a substantial amount to bind papers or leaves is the same when compared with a binding member whose top head portion is in a shape of an arch. As a result, the first and the second binding members are difficult to make an elastic transformation, thereby to effectively prevent a case such as a space between the distal end portions easily opens.

In case the file is arranged with the binding member mounted on the cover sheet body, an operation and an effect of the file are fundamentally the same as that of the above-mentioned binding member.

Especially, if the top head portion comprises the extending portion that extends generally parallel to the base, there is scarcely a dead space between the front cover sheet and the rear cover sheet when compared with a binding member whose top head portion is in a shape of an arch, thereby to effectively prevent a drop in storage efficiency and increasing an outer size of the file unnecessarily.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a general perspective view of a principal part showing a file comprising a binding member in accordance with a first embodiment of the present claimed invention.

Fig. 2 is a magnified front view showing the binding member in accordance with the embodiment.

Fig. 3 is a magnified left side view showing the binding member in accordance with the embodiment.

Fig. 4 is a magnified plane view showing the binding member in accordance with the embodiment.

Fig. 5 is a magnified right side view showing the binding member in accordance with the embodiment.

Fig. 6 is a functional explanatory view of the embodiment.

Fig. 7 is an operating instruction view of the

embodiment.

Fig. 8 is an operating instruction view of the embodiment.

Fig. 9 is an operating instruction view of the embodiment.

Fig. 10 is a view showing a modified form of the embodiment.

Fig. 11 is a view showing another modified form of the embodiment.

Fig. 12 is a magnified front view of a binding member in accordance with a second embodiment of the present claimed invention.

Fig. 13 is a magnified plane view showing the binding member in accordance with the embodiment.

Fig. 14 is a functional explanatory view of the embodiment.

Fig. 15 is a magnified perspective view of a principal part showing a file comprising a conventional binding member.

Fig. 16 is an explanatory view to explain a conventional problem.

Fig. 17 is an explanatory view to explain a conventional problem.

BEST MODES OF EMBODYING THE INVENTION

<First Embodiment>

Fig. 1 shows a general perspective view of a principal part showing a file 2 comprising a binding member 1, each of Fig. 2 through Fig. 5 shows a magnified front view of the

binding member 1, a magnified left side view thereof, a magnified plane view thereof and a magnified right side view thereof. The file 2 comprises a cover sheet body 3 having a front cover sheet 31 and a rear cover sheet 32 each of which is continuous through a scroop 33 and the binding member 1 mounted on an inner face of the rear cover sheet 32.

The binding member 1 comprises a pair of first binding members 11, 11 and a pair of second binding members 12, 12 corresponding to the first binding members 11, 11 each of which is mounted on a base 10 and has an arrangement that a space between a distal end portion 11a of the first binding member 11 and a distal end portion 12a of the corresponding second binding member 12 is closed or open through a relatively rotational movement of the first binding member 11 and the corresponding second binding member 12 as shown in Fig. 2. In addition the binding member 1 further comprises a release means 4 that applies a force toward a direction to open the space between the distal end portion 11a of the first binding member 11 and the distal end portion 12a of the corresponding second binding member 12 (refer to Fig. 4) and an operating lever 5 that keeps the distal end portion 11a and the distal end portion 12a at a closed position by relatively rotating the first binding member 11 and the corresponding second binding member 12 in the teeth of the release means 4.

More specifically, the first binding member 11 and the second binding member 12 form an arch-shaped closed loop in a state the space is closed. The first binding member 11

comprises a rising area 11x that rises from the base 10 in a generally vertical manner and a curved area 11y that curves gently from a distal end side of the rising area 11x toward the second binding member 12 as shown in Fig. 2. The second binding member 12 comprises a rising area 12x that rises from the base 10 by an elevation of a height a litter higher than the rising area 11x in the state the space is closed and a curved area 12y that curves from a distal end side of the rising area 12x toward the first binding member 11. The closed position of the distal end portions 11a and 12a locates at a position deviated from a top head portion T of an arch toward a side of the second binding member 12.

As shown in Fig. 1 and Fig. 4, each of the distal end portions 11b and 11b of a pair of the first binding members 11 and 11 is connected by a connecting portion 13 and a rotational axis portion 13a constituting both ends of the connecting portion 13 is rotatably mounted on a bearing 10a arranged on the base 10. A pair of the second binding members 12 and 12 are mounted with each of proximal end portions 12b fixed to the base 10. A bound state or a released state of papers or leaves can be realized by rotating the first binding member 11 with the rotational axis portion 13a used as a fulcrum so as to close or open the space between the distal end portion 11a of the first binding member 11 and the distal end portion 12a of the second binding member 12.

The release means 4 has an arrangement that a crank axle 41 formed to be parallel to the rotational axis portion

13a by inflecting a part of the connecting portion 13 of the first binding member 11 in a shape of a crank is arranged at a position displaced from the rotational axis portion 13a and a blade spring 42 is arranged with its proximal end edge 42a fixed to the base 10 and its distal end edge 42b elastically making contact with the crank axle 41 upward from below as shown in Fig. 4. The release means 4 is so arranged that an elastic force is applied to the proximal end portion 11b locating at or near the closed position so as to push the first binding member 11 toward a direction to open the space through the connecting portion 13 by making use of an action of the blade spring 42.

The operating lever 5 comprises, as shown in Fig. 3, a rotational arm 51, a transmission portion 52 that is integrally continuous to the rotational arm 51 toward a direction generally vertical thereto and an operating end portion 53 that is arranged to rise on a distal end side of the transmission portion 52 to be in a reverse L shape. A proximal end of the rotational arm 51 is rotatably mounted on a supporting portion 10b arranged to rise on the base 10 through an arm supporting axis 51a parallel to a direction to open or close the first and the second binding members 11, 12 and a roller 54 is mounted on an intersection of the rotational arm 51 and the transmission portion 52 through a roller supporting axis 54a generally parallel to the base 10. The operating end portion 53 locates at a position popped upward obliquely in a released position as shown by an imaginary line in Fig. 2 and Fig. 3 and the roller 54 makes

a contact with the crank axel 41 of the connecting portion 13 at a position displaced from a center of the crank axel 41 in a condition of being able to roll. When the operating end portion 53 is pushed down from this position, the rotational arm 51 makes a rotational movement around the arm supporting axis 51a and the roller 54 moves toward a center portion of the connecting portion 13 with rolling on the connecting portion 13 and pushes the connecting portion 13 downward in the teeth of the blade spring 42. During this period, an elastic force is stored in the blade spring 42 and the distal end portion 11a of the first binding member 11 approaches the distal end portion 12a of the second binding member 12 with rolling so as to finally close the space between the distal end portions 11a and 12a. More specifically, the roller 54 moves from a position shown by an imaginary line in Fig. 3 to a position a little higher than the lowest point shown by a solid line in Fig. 3 after passing the lowest point. Since the rotational arm 51 is in a condition of generally vertical to the crank axel 41 of the connecting portion 13, the connected portion 13 is kept in a pressed condition under the action of toggle even though an operational force to the operating end portion 53 is removed, and then the binding members 11 and 13 are kept in a closed condition. A pressing force of the connecting portion 13 is received by the blade spring 42.

When the operating lever 54 is operated upward from this position, the roller 54 is supposed to move on the connecting portion 13 pushed by the blade spring 42 toward a

reverse direction from the above and the distal end portion 11a of the first binding member 11 is supposed to be separated from the distal end potion 12a of the second binding member 12 with the first binding member 11 rolling backward after the roller 54 passes the lowest point. However, in this embodiment the space between the distal end portions 11a, 12a is not open just by this operation due to an engaging portion 6 which will be described later. When the operating lever 5 moves from a state shown by the solid line in Fig. 3 to a state shown by the imaginary line in Fig. 3, the operating lever 5 is halted at a predetermined position by means of a stopper mechanism, not shown in drawings, arranged between the operating lever 5 and the base 10 or between near the operating lever 5 and near the base 10.

For the binding member 1 of the above arrangement in this embodiment, between the distal end portions 11a and 12a arranged is the engaging portion 6 that engages the first and the corresponding second binding members 11 and 12 through a temporary elastic transformation of the first binding member 11 or the corresponding second binding member 12 and that prohibits the distal end portions 11a and 12a from making a movement to open the space between the distal end portions 11a and 12a by engaging the first and the corresponding second binging members 11 and 12 further more tightly with making use of the force applied by the release means 4.

The engaging portion 6 comprises, as shown in Fig. 5

and Fig. 6 (a) through (c), an outward facing unciform portion 61 in a shape of cutting a part of an outer side of the distal end portion 11a of the first binding member 11 and an inward facing unciform portion 62 in a shape of cutting a part of an inner side of the distal end portion 12a of the second binding member 12. Each of the outward facing unciform portion 61 and the inward facing unciform portion 62 has a chevron engaging portion 61a, 62a near the distal end thereof and a valley-shaped engaging portion 61b, 62b adjacent to a proximal end side of the chevron engaging portion 61b, 62b and an undercut portion 61ax, 62ax is formed at a boundary between the chevron engaging portion 61a, 62a and the valley-shaped engaging portion 61b, 62b as shown in Fig. 6 (b) and (c). The chevron engaging portion 61a (62a) of the unciform portion 61 (62) and the valley-shaped engaging portion 61b, 62b of the unciform portion 62 (61) are in a concave-convex relationship and each of the chevron engaging portions 61a and 62a has the same shape and each of the valley-shaped engaging portions 61b and 62b has the same shape.

When the distal end portions 11a, 12a of the first and the second binding members 11, 12 approach each other from a state shown in Fig. 6 (c) to a state shown in Fig. 6 (b), the chevron engaging portions 61a and 62a make an engagement each other further more tightly with robbing each other as the first binding members 11 and 11 temporarily make an elastic transformation toward a direction to approach each other and the second bind members 12 and 12 temporarily make

an elastic transformation toward a direction to be separated from each other. When the chevron engaging portion 61a (62a) falls in the valley-shaped engaging portion 62b (61b), the engaging portion 6 is formed as shown in Fig. 6 (a) and the first binding member 11 and the second binding member 12 are made to be a linear body apparently with forming a single continuous loop through the engaging portion 6. Then each of the first binding member 11 and the second binding member 12 is restored to an original state from an elastically transformed state.

In this embodiment the first and the second binding members 11, 12 are kept to be in a state the space is closed wherein the space between the distal end portions 11a and 12a is closed not by a closing means to push the distal end portions 11a and 12a toward a direction to close the space but by the release means 4 to push the distal end portions 11a and 12a toward a direction to open the space. The reasons are that it possible to open or close the binding members 11, 12 smoothly without an excessive force to operate the binding members, to prevent noise due to a rapid movement or scary feeling in a case to close the space between the first binding member 11 and the second binding member 12 and to reduce a number of components because there is no need of additional component as a release means.

A slit 31a is arranged on the front cover sheet 31 of the cover sheet body 3 at a position corresponding to an arch that is formed when the space between the first and the second binding members 11, 12 is closed and the top head

portion T of the arch can be inserted into the slit 31a. A projection 31a1 that makes an engagement with an inner periphery of the arch is arranged on an opening edge of the slit 31a. The projection 31a1 and the slit 31a are to maintain a condition that the cover sheet body 3 is closed.

As mentioned above, the binding member 1 in accordance with the embodiment and the file 2 on which the binding member 1 is mounted are so arranged that the first and the second binding members 11 and 12 make a relatively rotational movement toward a direction to close the space between the distal end portions 11a and 12a in the teeth of the force applied by the release means 4 when the operating lever 5 is operated toward a direction to close the space between the distal end portions 11a and 12a of the first and the second binding members 11, 12. Then the engaging portion 6 that is arranged between the distal end portions 11a and 12a makes an engagement through a temporary elastic transformation of the first and the second binding members 11, 12 and a state in which papers or leaves are bound by the first and the second binding members 11 and 12 can be obtained as shown by a solid line in Fig. 1 through Fig. 4 under a keeping force by the operating lever 5.

The engaging portion 6 is so arranged that the chevron engaging portion 61a (62a) and the valley-shaped engaging portion 62b (61b) make an engagement further more tightly by the force applied by the release means 4 toward a direction shown by an arrow in Fig. 6 (a) and the engaged state can not be released without applying a movement of a temporary

elastic transformation as shown by an arrow in Fig. 6 (b). This is because each of the undercut portions 61ax and 62ax locating at a basal part of the chevron engaging portion 61a, 62a shown in Fig. 6 (a), (c) makes an engagement each other when the first and the second binding members 11, 12 are to be released along an axial line. This makes it possible to effectively prevent the first and the second binding members from making a transformation, resulting in reclosing the first and the second binding members 11, 12 in the improper paired condition even though the first and the second binding members 11, 12 are likely to transform elastically toward a direction to open the space between the distal end portions 11a, 12a because an external force is accidentally applied to the first or the second binding member 11, 12 due to drops of the binding member 1 or any other cause. For example, in a case that the file 2 drops on a floor with its top head portion T first in a condition that the front cover sheet 31 and the rear cover sheet 32 of the cover sheet body 3 open, the top head portion T receives a reactive force from the floor, or an inertial gravity from the bound papers or leaves acts mainly on the second binding member 12 and then an outward external force to open the closed loop formed with the first and the second binding members 11, 12 acts on the first and the second binding members 11, 12. However, the space between the distal end portions 11a, 12a is kept in a closed condition because the engaging potion 6 has an arrangement of making an engagement in the teeth of a force to open the closed loop. In a case that the file 2

drops with a longitudinal direction of the scroop 33 first, the space between the distal end portions 11a, 12a can be kept in a closed condition since the engaging portion 6 engages itself further more tightly by its movement in either one of the two closed loops each consisting of the first binding member 11 and the second binding member 12 even though an external force is applied especially to the second binding member 12 toward the first binding member 11 to make the first and the second binding members 11, 12 improperly paired along a longitudinal direction of the scroop 33 due to an inertial gravity from the bound papers or leaves acting mainly on the second binding member 12.

If the operating lever 5 is operated as shown by an arrow in Fig. 7 so as to release a keeping force to keep the space between the distal end portions 11a, 12a of the first and the second binding members 11, 12 in a closed position and next the first binding member 11, 11 is elastically transformed temporarily by human as shown by an arrow in Fig. 8, the engaging portion 6 is released from engagement in sequence of Fig. 6 (a), (b) and (c). Since a force toward a direction to open the space between the distal end portions 11a, 12a is applied to the first and the second binding members 11, 12 by the release means 4, the first and the second binding members 11, 12 make a relatively rotational movement toward a direction to open the space between the distal end portions 11a, 12a so as to obtain a released state of binding.

As mentioned above, in accordance with this embodiment,

it is possible to effectively prevent improper binding or dropping the papers or leaves or no-op of the operating lever 5 by prohibiting the distal end portions 11a, 12a of the first and the second binding members 11, 12 from making an elastic transformation toward a direction to open the space between the distal end portions 11a, 12a even though an external force is accidentally applied to the first or the second binding member 11, 12 due to drops of the binding member 1 or any other cause. As a result of this, the binding member 1 can be made solid against drop or accidental collision and reliability and durability as the binding member 1 can be effectively improved.

In addition, the engaging portion 6 is so arranged to make an engagement by making use of a temporary elastic transformation of the first binding members 11, 11 toward a direction to which both of the first binding members 11 and 11 approach each other and the elastic transformation toward the direction to approach each other can be conducted with ease by pinching the first binding members 11 and 11 with a finger or the like. As a result of this, it is possible to release a bound state of the first and the second binding members 11, 12 easily with a single hand.

Since the engaging portion 6 also makes an engagement by making use of a temporary elastic transformation of the second binding members 12, 12 toward a direction to which both of the second binding members 12 and 12 are separated from each other, the elastic transformation toward the direction to be separated from each other can be conducted

with ease by separating the second binding members 12 and 12 with both hands. As a result of this, it is possible to release a bound state of the first and the second binding members 11, 12 easily with both hands even though the first and the second binding members 11, 12 are given a relatively high rigidity.

As a concrete arrangement since the engaging portion 6 has an engaging arrangement in which the outward facing unciform portion 61 makes an engaging with the inward facing unciform portion 62, it is possible to realize the engaging portion 6 that makes a smooth engaging movement when closing and that makes an engagement with each other further more tightly against the force applied toward a direction to which the space between the distal end portions 11a, 12a is open precisely with a simple processing or the like.

In case the file 2 is arranged with the binding member 1 mounted on the cover sheet body 3, an operation and an effect of the file 2 are fundamentally the same as that of the above-mentioned binding member 1.

The engaging portion 6 in accordance with the embodiment has an arrangement in which the outward facing unciform portion 61 is arranged at the distal end portion 11a of the first binding member 11 and the inward facing unciform portion 62 is arranged at the distal end portion 12a of the second binding member 12 and the first binding member 11 makes an engagement with the second binding member 12 through the outward facing unciform portion 61 and the inward facing unciform portion 62 by making use of the

temporary elastic transformation wherein each of the first binding members 11 moves toward a direction to which the first binding members 11 and 11 approach each other and each of the second binding members 12 moves toward a direction to which the second binding members 12 and 12 are separated from each other, however, an inward facing unciform portion may be arranged at a side of the distal end portion 11a of the first binding member 11 and an outward facing unciform portion may be arranged at a side of the distal end portion 12a of the second binding member 12.

A direction of the elastic transformation is not limited to the above as long as the engaging portion makes an engagement through a temporary elastic transformation and the engaging state becomes further more tightly by a force applied by a releasing movement of the release means 4.

For example, an engaging portion 6α shown in Fig. 10 is so arranged that an upward facing unciform portion 61α is arranged at the distal end portion 11a of the first binding member 11 and a downward facing unciform portion 62α is arranged at the distal end portion 12a of the second binding member 12 and the first binding member 11 makes an engagement with the second binding member 12 through the upward facing unciform portion 61α and the downward facing unciform portion 62α by making use of the temporary elastic transformation wherein the distal end portion 11a of the first binding member 11 gets into under the distal end portion 12a of the second binding member 12.

For example, even though the file 2 drops on a floor

with its top head portion T first and an outward external force to open the closed loop formed with the first and the second binding members 11, 12 acts on the first and the second binding members 11, 12, since the engaging portion 6α has an arrangement to engage in the teeth of a direction to open the closed loop, the space between the distal end portions 11a, 12a can be kept closed. Especially, when the file 2 drops on a floor with its top head portion T first, the second binding member 12 might transform plastically toward a direction to buckle due to a reactive force from the floor or a compressive force from the bound papers or leaves. However, in accordance with the ups and downs engaging arrangement as shown in Fig. 10, since the second binding member 12 is prevented from getting into under the first binding member 11, the second binding member 12 can be effectively prevented from plastic transformation. In addition, even though the second binding member 12 might be plastically transformed, the space between the first and the second binging members 11 and 12 can be avoided from opening, thereby to prevent the bound papers or leaves from scattering. As a result of this, the file 2 can be made more solid against the outward external force to open the closed loop applied to the first and the second binding members 11, 12.

The engaging portion 6α shown in Fig. 10 has the above-mentioned effect, however, it is hard to say solid against the external force to make the first and the second binding members 11, 12 improperly paired along a

longitudinal length of the scroop 33. Then if an engaging arrangement is an engaging portion 6β shown in Fig. 11, the engaging portion 6β can be made more solid against the external force to open the closed loop applied to the first and the second binding members 11, 12 and the file 2 can be realized that is solid against the external force along a longitudinal length of the scroop 33.

The engaging portion 6β comprises an outward facing unciform portion 61β1 and an upward facing unciform portion 61β2 arranged at the distal end portion 11a of the first binding member 11 and an inward facing unciform portion 62β1 and a downward facing unciform portion 62β2 arranged at the distal end portion 12a of the second binding member 12 wherein the outward facing unciform portion 61β1 hooks against the inward facing unciform portion 62β1 and the upward facing unciform portion 61β2 hooks against the downward facing unciform portion 62β2 so as to engage the first binding member 11 with the second binding member 12 by both a movement of temporary elastic transformations of the first binding members 11 and 11 approaching each other and the second binding members 12 being separated from each other and a movement of temporary elastic transformations of the first binding member 11 getting into relatively under the second binding member 12 are caused simultaneously or around the time. In this case also, an undercut portion 61β1x of the outward facing unciform portion 61β1 and an undercut portion 62β1x of the inward facing unciform portion 62β1 engage each other and an undercut portion 61β2x of the

upward facing unciform portion 61β2 and an undercut portion 62β2x of the downward facing unciform portion 62β2 engage each other.

In accordance with the arrangement, a space between the distal end portions 11a, 12a can be kept in a closed condition against the external force to open the closed loop applied to the first binding member 11 and the second binding member and the second binding member 12 is prohibited from a movement of getting into under the first binding member 11 by a compressive force, thereby to make the file 2 solid against the external force to make the first and the second binding members 11, 12 improperly paired along a longitudinal direction of the scroop 33. As a result, it is possible to prevent the papers or leaves from dropping out so as to main a function as the file 2 more precisely even through the file 2 drops on a floor with its top head portion T first or with its longitudinal direction of the scroop 33 along the floor.

<Second Embodiment>

The binding member 101 of this embodiment shown in Fig. 12 and Fig. 13 has fundamentally the same arrangement as that of the binding member 1 in accordance with the first embodiment. Same numerals are given to common components and explanation is omitted.

Shapes of the first and the second binding members 111, 112 of the binding member 101 are different from those of the first and the second binding members 11, 12 constituting the binding member 1 in accordance with the first embodiment.

The first binding member 111 and the second binding member 112 form a D-shape in a closed state. The first binding member 111 comprises a rising area 111x that rises generally vertical to the base 10 in a closed state, a curved area 111y that describes a big moderate curve from a distal end side of the rising area 111x toward the second binding member 112 and an extending area 111z that extends generally parallel to the base 10 from the curved area 111y. The second binding member 112 comprises a rising area 112x that rises from the base 10 by a height longer than a height of the rising area 111x and a curved area 112y that describes a curve in a curvature radius far smaller than that of the curbed area 111y from a distal end side of the rising area 112x. A closed position locates at a portion constituting a top head portion T of the D-shape where a distal end portion 111a of the first binding member 111 meets a distal end portion 112a of the second binding member 112 facing upward at an angle and generally above the rising area 112x of the second binding member 112.

The engaging portion 6 comprising unciform portions having the same arrangement as that of the first embodiment is arranged at each of distal end portions 111a and 112a of the first binding member 111 and the second binding member 112. Other arrangement of the release means 4 or the operating lever 5 may be the same as that of the first embodiment.

As mentioned above, since the top head portion T consists of the extending area 111z extending generally

parallel to the base 10 out of the first and the second binding members 111 and 112, as is clear from a comparison between Fig. 2 and Fig. 12, a length from a proximal end portion of the binding member 101 to a distal end portion thereof (same applies to a height) becomes small although a substantial amount to bind papers or leaves is the same when compared with a binding member whose top head portion T is in a shape of an arch. As a result, the first and the second binding members 111, 112 are difficult to make an elastic transformation, thereby to effectively prevent a case such as a space between the distal end portions 111a, 112a easily opens.

Other arrangement produces the same operation and effect as that of the first embodiment.

In this embodiment, especially, the top head portion T comprises the extending portion 111z that extends generally parallel to the base 10 and the rising area 112x as the substantial area to bind papers or leaves occupies almost all of the internal dimension between the front cover sheet 31 and the rear cover sheet 32 as shown in Fig. 14, thereby to scarcely form a dead space between the front cover sheet 31 and the rear cover sheet 32 when compared with a binding member whose top head portion T is in a shape of an arch. As a result, it is possible to effectively prevent a drop in storage efficiency and increasing an outer size of the file unnecessarily.

A concrete arrangement of each component is not limited to the above-described embodiment. For example, it

is a matter of course that the engaging portion may have a shape other than the above-described shape. In addition, in the above embodiment the engaging portion has an arrangement in which the engaged state is released with movements of a pair of the first binding members approaching each other and a pair of the second binding members being separated from each other, however, the engaging portion may have an arrangement in which the engaged state is released with movements of a pair of the first binding members toward the same direction and the second binding members toward the opposite direction. Further, the first and the second binding members may make an open and close movement with a rotational movement of each binding members. Other arrangement may be various modifications without departing from the spirit of the invention.

POSSIBLE APPLICATIONS IN INDUSTRY

As mentioned above, in accordance with the present claimed invention, since the binding member can be kept in an appropriate bound state and a function of the binding member can be kept unharmed even though the binding member is dropped, it is possible to make effective use of a file that is used with an intention that the file can bind a large amount of papers or leaves or can be used by children or the file can be carried frequently. In addition, in a case that the file is stored in a shelf, an efficiency of storing can effectively be improved.

CLAIMS

1. A binding member comprising a pair of first binding members and a pair of second binding members corresponding to the first binding members wherein a bound state or a released state of papers or leaves can be realized by closing or opening a space between a distal end portion of the first binding member and a distal end portion of the corresponding second binding member through a relatively rotational movement of the first binding member and the corresponding second binding member, and further comprising a release means that applies a force toward a direction to open the space between the distal end portion of the first binding member and the distal end portion of the corresponding second binding member and an operating lever that keeps the distal end portion of the first binding member and the distal end portion of the corresponding second binding member at a closed position by relatively rotating the first binding member and the corresponding second binding member in the teeth of the release means, characterized by that between the distal end portions arranged is an engaging portion that engages the distal end portions of the first and the corresponding second binding members through a temporary elastic transformation of at least either one of the first binding member and the corresponding second binding member and that prohibits the distal end portions from making a movement to open the space between the distal end portions by engaging the first and the corresponding second binding members further more

tightly with making use of the force applied by the release means.

2. The binding member described in claim 1 wherein the engaging portion makes an engagement by making use of the temporary elastic transformation of the first binding members or the second binding members toward a direction to which the first binding members approach each other or the second binding members approach each other.

3. The binding member described in claim 1 wherein the engaging portion makes an engagement by making use of the temporary elastic transformation of the first binding members or the second binding members toward a direction to which the first binding members are separated from each other or the second binding members are separated from each other.

4. The binding member described in claim 2 or 3 wherein the engaging portion comprises an inward facing unciform portion arranged at either one of the first binding member and the second binding member and an outward facing unciform portion arranged at the other binding member.

5. The binding member described in claim 1, 2, 3 or 4 wherein each of the first binding member and the second binding member is so arranged to rise with a proximal end portion thereof mounted on a base and a top head portion

extending generally parallel to the base is arranged on at least either one of the first binding member and the second binding member locating at a rising end side in a state the space is closed.

6. A file having an arrangement that a binding member is mounted on a part of a cover sheet body,
wherein the binding member comprises a pair of first binding members and a pair of second binding members corresponding to the first binding members wherein a bound state or a released state of papers or leaves can be realized by closing or opening a space between a distal end portion of the first binding member and a distal end portion of the corresponding second binding member through a relatively rotational movement of the first binding member and the corresponding second binding member, and further comprising a release means that applies a force toward a direction to open the space between the distal end portion of the first binding member and the distal end portion of the corresponding second binding member and an operating lever that keeps the distal end portion of the first binding member and the distal end portion of the corresponding second binding member at a closed position by relatively rotating the first binding member and the corresponding second binding member in the teeth of the release means, characterized by that between the distal end portions arranged is an engaging portion that engages the distal end portions of the first and the corresponding second binding

members through a temporary elastic transformation of at least either one of the first binding member and the corresponding second binding member and that prohibits the distal end portions from making a movement to open the space between the distal end portions by engaging the first and the corresponding second binging members further more tightly with making use of the force applied by the release means.

7. The file described in claim 6 wherein the engaging portion makes an engagement by making use of the temporary elastic transformation of the first binding members or the second binding members toward a direction to which the first binding members approach each other or the second binding members approach each other.

8. The file described in claim 6 wherein the engaging portion makes an engagement by making use of the temporary elastic transformation of the first binding members or the second binding members toward a direction to which the first binding members are separated from each other or the second binding members are separated from each other.

9. The file described in claim 7 or 8 wherein the engaging portion comprises an inward facing unciform portion arranged at either one of the first binding member and the second binding member and an outward facing unciform portion arranged at the other binding member.

10. The file described in claim 6, 7, 8 or 9 wherein each of the first binding member and the second binding member is so arranged to rise with a proximal end portion thereof mounted on a base and a top head portion extending generally parallel to the base is arranged on at least either one of the first binding member and the second binding member locating at a rising end side in a state the space is closed.