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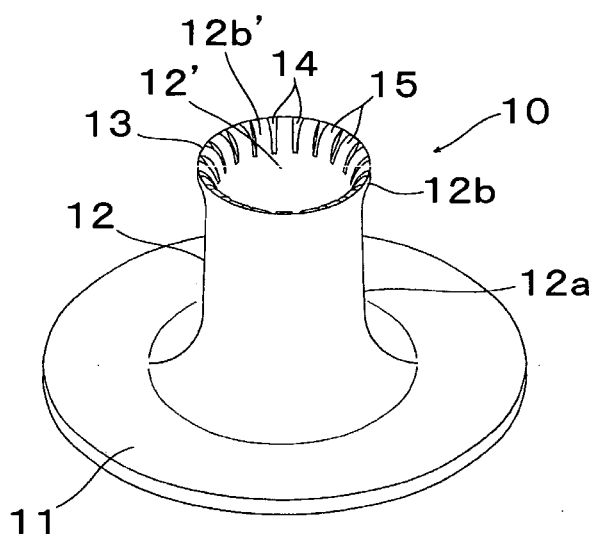
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(54) **MEMBER FOR ATTACHING BUTTON AND BUTTON**

(57) There is provided a button fastener which can reduce failures in fastening a button to a cloth, expand a range of sorts and thicknesses of cloths applicable, and reduce costs by thinning a post of the button fastener. The button fastener comprises a disk-like base (11) and a cylindrical post (12) which protrudes from the base (11). At a distal portion (12b) of the post (12), a plurality of hollows (14) and a plurality of bulges (15) are formed alternately in the circumferential direction. When the post (12) of the button fastener (20) is piercing the cloth (1)

at the time of the button (20) being fastened to the cloth (1), the cloth (1) is being compressed by the top (13) of the post (12). In addition, each of the bulges (15) bites into the cloth (1) so as to press the cloth (1) in a concentrated manner while the cloth (1) penetrates into the hollows (14) so as to relieve the press. Thereby, parts of the cloth (1) corresponding to between the bulges (15) and the hollows (14) are made tense. With such presses and tensions or strong and weak presses alternate in the circumferential direction, it will be easier to cut the cloth (1) by the post (12).

[FIGURE 1]



Description

BACKGROUND OF THE INVENTION

5 **[0001]** The present invention relates to a button fastener and a button, and more specifically, to a button fastener which is a type of fastening a button to a cloth by plastically deforming a cylindrical post of the button fastener, and a button such as a male snap button, a decorative button which is fastened to a cloth with the button fastener.

10 **[0002]** A male snap button of snap buttons, which is widely used for parts to be put together of clothing, includes a projection to engage and disengage with a projection-receiving space of a female snap. As one type as a male snap button, one has been known which is formed by drawing a metal plate and includes a projection with a closed top and an open bottom. When this type of a male snap button is to be fastened to a cloth using a button fastener having a cylindrical post, the post, which has just passed through the cloth, is inserted into an inner space of a projection of the male snap button and then is deformed and fixed within the space. A combination of the male snap button and the button fastener is disclosed in e.g. US Patent No. 3,351,987. A decorative button having a dome-like projection, which is fastened to e.g. a corner of a pocket of jeans, also receives the post, after it has passed through the cloth, in an inner space of the projection and then deform the post to be fixed in the space, fastening the button to the cloth.

15 **[0003]** During the post piercing the cloth in fastening a button having a projection with a closed top as mentioned above, the post as trying to pierce the cloth receives a piercing force (or a resistant load to piercing) from the cloth. Then, depending on a sort or a thickness of the cloth, there would arise a failure in fastening the button because, for instance, the post is deformed while piercing the cloth due to an excessive piercing force. Therefore, there is a limitation in choosing a sort or a thickness of the cloth to which a button fastener is applicable. To deal with this problem, the thickness of a post of a button fastener is maintained more than a certain thickness, which increases in costs.

[0004] [Patent document 1] US Patent No. 3,351,987

20 **[0005]** An object of the invention as made in view of such problems as mentioned above is to provide a button fastener and a button, which can reduce failures in fastening the button to a cloth, expand a range of sorts and thicknesses of cloths applicable, and reduce costs by thinning a post of a button fastener.

SUMMARY OF THE INVENTION

30 **[0006]** To solve the problems, according to the present invention, there is provided a button fastener for fastening a button to a cloth, comprising a plate-like base, and a cylindrical post which protrudes from the base, wherein, at a distal portion of the post, a plurality of hollows and a plurality of bulges are formed alternately in the circumferential direction. In the invention, a cloth covers fabric, textile, felt, nonwoven fabric, leather, resin sheet, etc. The base generally has a disk-like shape, but not limited thereto, so it may be a triangular shape, a rectangular shape, or other polygonal shape, etc.

35 **[0007]** In the invention, with a plurality of the hollows and a plurality of the bulges arranged alternately in the circumferential direction at the distal portion of the post of the button fastener, when the post of the button fastener is piercing the cloth at the time of the button being fastened to the cloth, the cloth is being compressed by the top of the post. In addition, each of the bulges bites into the cloth so as to press the cloth in a concentrated manner while the cloth penetrates into the hollows so as to relieve the press. Thereby, parts of the cloth corresponding to between the bulges and the hollows are made tense. With such presses and tensions or strong and weak presses alternate in the circumferential direction, it will be easier to cut the cloth by the post.

40 **[0008]** As materials of the button fastener in accordance with the invention, metal such as copper alloy, aluminum alloy can be preferably cited. The button fastener can be formed such as by drawing a metal plate.

45 **[0009]** In an embodiment of the invention, the distal portion of the post includes an inclined inner periphery surface, the diameter of which gradually expands toward the top of the post, and said hollows and said bulges are formed on the inclined inner periphery surface. By providing the hollows and bulges on the inclined inner periphery surface of the distal portion of the post with the diameter of the periphery surface expanding toward the top of the post, it will be easier to bring the hollows and bulges to contact the cloth at the time of piercing the cloth by the post.

50 **[0010]** In an embodiment of the invention, the button includes an projection having a closed distal end and an open proximal end as a post-receiving opening, and the projection defines interiorly a post-fixing space for receiving the post, which has just pierced the cloth, through the post-receiving opening and deforming it to be fixed in the space. As a button having such a projection, a male snap button, a decorative button, etc. can be specifically cited.

55 **[0011]** According to another aspect of the invention, there is provided a button which is fastened to a cloth using a button fastener including a cylindrical post, comprising an projection having a closed distal end and an open proximal end as a post-receiving opening, and a flange extending radially outward from the projection, wherein the projection defines interiorly a post-fixing space for receiving the post, which has just pierced the cloth, through the post-receiving opening and deforming it to be fixed in the space, wherein, on an inner periphery surface of a proximal portion of the projection, a plurality of hollows and a plurality of bulges are formed alternately in the circumferential direction.

[0012] In the invention, with a plurality of the hollows and a plurality of the bulges arranged alternately in the circumferential direction at the proximal portion of the projection of the button, when the post of the button fastener is piercing the cloth at the time of the button being fastened to the cloth, the cloth is being compressed by the post of the button fastener from below by being held between the upper button and the lower post. In addition, on the upper side of the cloth, each of the bulges bites into the cloth so as to press the cloth in a concentrated manner while the cloth penetrates into the hollows so as to relieve the press. Thereby, parts of the cloth corresponding to between the bulges and the hollows are made tense. With such presses and tensions or strong and weak presses alternate in the circumferential direction, it will be easier to cut the cloth by the post.

[0013] As materials of the button in accordance with the invention, metal such as copper alloy, aluminum alloy can be preferably cited. The button can be formed such as by drawing a metal plate.

[0014] In an embodiment of the invention, the inner periphery surface of the proximal portion of the projection is an inclined inner periphery surface, the diameter of which gradually reduces toward the distal end side of the projection, and said hollows and said bulges are formed on the inclined inner periphery surface. By providing the hollows and bulges on the inclined inner periphery surface of the proximal portion of the projection with the diameter of the periphery surface reducing toward the distal end side of the projection, it will be easier to bring the hollows and bulges to contact the cloth at the time of piercing the cloth by the post.

[0015] In an embodiment of the invention, the button is a male snap button or a decorative button.

[0016] In the button fastener in accordance with the invention, a plurality of the hollows and a plurality of the bulges as formed at the distal portion of the post alternately in the circumferential direction will be contacting the cloth at the time of piercing the cloth, exerting circumferentially alternate strong and weak presses or presses and tensions on the cloth. Thereby, a piercing force or load which the post would receive from the cloth at the time of piercing the cloth will be reduced, making it easier to pierce the cloth. As a result, the button fastener can reduce failures in fastening the button to the cloth, expand a range of sorts and thicknesses of cloths applicable, and reduce costs by thinning the post of the button fastener.

[0017] In the button in accordance with the invention, a plurality of the hollows and a plurality of the bulges as formed on the inner periphery surface of the proximal portion of the projection alternately in the circumferential direction will be contacting the cloth at the time of piercing the cloth, exerting circumferentially alternate strong and weak presses or presses and tensions on the cloth. Thereby, a piercing force or load which the post of the button fastener would receive from the cloth at the time of piercing the cloth will be reduced, making it easier to pierce the cloth. As a result, the button can reduce failures in fastening the button to the cloth, expand a range of sorts and thicknesses of cloths applicable, and reduce costs by thinning the post of the button fastener.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018]

Fig. 1 is a perspective view of a button fastener in accordance with an embodiment of the invention;

Fig. 2 is a top (plan) view of the button fastener in Fig. 1;

Fig. 3 is an illustrative longitudinal sectional view of the button fastener in Fig. 1;

Fig. 4 is an illustrative sectional view taken along line A-A in Fig. 3;

Fig. 5 is an illustrative sectional view showing an arrangement of a button, a cloth and the button fastener when the button is to be fastened to the cloth;

Fig. 6 is an illustrative sectional view showing a state where the cloth is being held between the button and a post of the button fastener in a button-fastening process;

Fig. 7 is an illustrative sectional view showing a state immediately after the post of the button fastener has just cut the cloth;

Fig. 8 is an illustrative sectional view showing a state where fastening the button to the cloth is completed;

Fig. 9 is a bottom view of a button (male snap button) in accordance with another embodiment of the invention;

Fig. 10 is an illustrative longitudinal sectional view of the button in Fig. 9;

Fig. 11 is an illustrative sectional view showing an arrangement of the button, the cloth and a button fastener when the button is to be fastened to the cloth;

Fig. 12 is an illustrative sectional view showing a state where the cloth is being held between the button and a post of the button fastener in a button-fastening process;

Fig. 13 is an illustrative sectional view showing a decorative button as another example of a button in accordance with the invention;

Fig. 14 is a cutaway perspective view showing another example of hollows and bulges as formed at a distal portion of a post of a button fastener; and

Fig. 15 is a cutaway perspective view showing another example of hollows and bulges as formed at a proximal

portion of a projection of a button.

DETAILED DESCRIPTION OF THE INVENTION

[0019] Hereinafter, preferred embodiments of a button fastener in accordance with the invention will be described with reference to the drawings. Figs. 1 to 3 show a perspective view, a top view and an illustrative longitudinal sectional view, respectively, of a button fastener 10 in accordance with an embodiment of the invention. Fig. 4 shows an illustrative sectional view taken along line A-A in Fig. 3. The button fastener 10, which is formed by drawing a plate of copper alloy, comprises a disk-like base 11 and a cylindrical post 12 which protrudes upward (up-and-down directions are based on Fig. 3 etc.) from the base 11 concentrically therewith, the top of the post 12 being open as a top opening 12'. A center part of the base 11 is open as a bottom opening 12" of the post 12. The post 12 includes a post body 12a which is gradually rising from the base 11 and then extends upward with almost constant inner and outer diameters, and a post distal portion 12b which extends from the upper end of the post body 12a to the top 13 of the post 12 while gradually expanding its inner and outer diameters radially outward. The thickness of the post distal portion 12b becomes thinner gradually from downward to upward, and the top 13 is made sharp. The inner periphery surface (inclined inner periphery surface) 12b' of the post distal portion 12b inclines to the top 13 while expanding its diameter. On the inclined inner periphery surface 12b', there are formed a plurality of hollows 14 as axially elongated grooves with a predetermined interval between two adjacent hollows 14 in the circumferential direction. With the hollows 14, parts between two circumferentially adjacent hollows 14 on the inclined inner periphery surface 12b' relatively bulge out radially inward (as bulges 15). Therefore, on the inclined inner periphery surface 12b', the hollows 14 and the bulges 15 are arranged alternately in the circumferential direction. Each hollow 14 has rectangular horizontal section (see Fig. 4), and reaches the top 13 of the post 12 while gradually expanding its width slightly upward, making the parts of the top 13 corresponding to the hollows 14 even sharper. The width of each bulge 15 is wider than that of each hollow 14 in this embodiment, but not limited thereto, so both of the widths may be almost the same, for instance.

[0020] Fig. 5 shows an arrangement of a male snap button (hereinafter referred to simply as "button") 20 as an example of a button, a cloth 1 and a button fastener 10 in the up-and-down direction when the button 20 is to be fastened to the cloth 1 using the button fastener 10. The male snap button 20, which is formed by drawing a plate of copper alloy, comprises a projection 21 which engages and disengages with a projection-receiving space of a female snap as not shown in the drawings, and a disk-like flange 22 which extends radially outward from the proximal (lower) end of the projection 21. A top (upper) side of the projection 21 is closed and a bottom side is open as a post-receiving opening 24. The projection 21 includes a projection body 21a, the inner and outer diameters of which gradually expand and then reduce from the top side toward the bottom side, and a projection proximal portion 21b, the inner and outer diameters of which gradually expand downward from the lower end of the projection body 21a. The boundary of the projection body 21a and the projection proximal portion 21b forms a narrow part 21c with the diameters reduced. The projection body 21a defines interiorly a post-fixing space 23 for receiving the post 12 of the button fastener 10 through the post-receiving opening 24 and deforming it to be fixed in the space. An inner periphery surface (inclined inner periphery surface) 21b' of the projection proximal portion 21b inclines while reducing its diameter upward.

[0021] Next, a process to fasten the button 20 to the cloth 1 using the button fastener 10 will be described. At the occasion of fastening the button 20 to the cloth 1, though not shown, the button 20 is held onto a button holder, which can move up and down, of a button-fastening machine, and the button fastener 10 is placed on a base body. Fig. 6 shows a state immediately before the post 12 of the button fastener 10 pierces the cloth 1 when the cloth 1 is being held between the button 20 being lowered and the post 12. At this time, the cloth 1 is being lifted up relatively by the post 12 of the button fastener 10 with the top 13 of the post 12 compressing the cloth 1 against the inclined inner periphery surface 21b' of the projection proximal portion 21b of the button 20. Further, the part of the cloth 1 corresponding to the post 21 is swelling upward into the post-receiving space 23 in the projection body 21a through the post-receiving opening 24. At this moment, upper side portions of the hollows 14 and the bulges 15 formed on the inclined inner periphery surface 12b' of the post distal portion 12b are contacting the cloth 1 while pressing it, and therefore, the cloth 1 partially penetrates into the hollows 14 while the bulges 15 bite into the cloth 1. Therefore, in addition to a press from the sharp top 13, presses and tensions or strong and weak presses alternate continuously in the circumferential direction because of the engagement with the hollows 14 and bulges 15 are exerted on the cloth 1. That is, parts of the cloth 1 corresponding to the bulges 15 are compressed in a concentrated manner, while parts corresponding to the hollows 14 are relieved from being compressed, making parts of the cloth 1 corresponding to between the bulges 15 and the hollows 14 tense in the radial direction. Therefore, it will be easier to cut the cloth 1 by the post 12 of the button fastener 10 than by a post of a conventional button fastener with no hollows and bulges, reducing a piercing force or load which the post 12 would receive from the cloth 1 at the time of piercing the cloth.

[0022] Fig. 7 shows a state immediately after the post 12 of the button fastener 10 has just cut the cloth 1. In this state, the top 13 of the post 12, which has just passed through the cloth 1, is contacting the inclined inner periphery surface 21b', at its upper side, of the projection proximal portion 21b of the button 20. Further, a circular portion of the cloth 1

corresponding to the post 12 has been separated from the cloth 1 as a cloth piece 1', which has come into the post-fixing space 23 in the projection body 21a. From this state, by further lowering the button 20, the post 12 of the button fastener 10 goes into the post-fixing space 23 of the button 20 and then is plastically deformed along the inner surface of the projection body 21a and fixed by the narrow part 21c as shown Fig. 8. Thereby, fastening the button 20 to the cloth 1 is completed. At this time, after the cloth piece 1' is received in the post 12 through the top opening 12' of the post 12 of the button fastener 10, the cloth piece 1' will be ejected out of the post 12 through the bottom opening 12".

[0023] Next, a preferred embodiment of a button in accordance with another aspect of the invention will be described with reference to the drawings. Figs. 9 and 10 show a bottom view and an illustrative longitudinal sectional view of a male snap button (hereinafter referred to simply as "button") 30 in accordance with an embodiment of the invention. The button 30 is the same as the male snap button 20 as shown in Figs. 5 to 8 except for hollows 35 and bulges 36 as described later. The button 30 comprises a projection 31 which engages and disengages with a projection-receiving space of a female snap as not shown in the drawings, and a disk-like flange 32 which extends radially outward from the proximal end of the projection 31. A top side of the projection 31 is closed and a bottom side is open as a post-receiving opening 34. The projection 31 includes a projection body 31a, the inner and outer diameters of which gradually expand and then reduce from the top side toward the bottom side, and a projection proximal portion 31b, the inner and outer diameters of which gradually expand downward from the lower end of the projection body 31a. The boundary of the projection body 31a and the projection proximal portion 31b forms a narrow part 31c with the diameters reduced. The projection body 31a defines interiorly a post-fixing space 33 for receiving a post 42 of a button fastener 40 (see Fig. 11) through the post-receiving opening 34 and deforming it to be fixed in the space. The button fastener 40 is the same as the button fastener 20 as described above except for lacking the hollows 14 and bulges 15, and comprises a disk-like base 41 and a cylindrical post 42 which protrudes upward from the base 41.

[0024] In the button 30, the inner periphery surface (inclined inner periphery surface) 31b' of the projection proximal portion 31b inclines while reducing its diameter toward the top side. On the inclined inner periphery surface 31 b', there are formed a plurality of hollows 35 as axially elongated grooves with a predetermined interval between two adjacent hollows 35 in the circumferential direction. With the hollows 35, parts between two circumferentially adjacent hollows 35 on the inclined inner periphery surface 31 b' relatively bulge out radially inward (as bulges 36). Therefore, on the inclined inner periphery surface 31 b', the hollows 35 and the bulges 36 are arranged alternately in the circumferential direction. The width of each bulge 36 is wider than that of each hollow 35 in this embodiment, but not limited thereto, and both of the widths may be almost the same, for instance.

[0025] Fig. 11 shows an arrangement of the button 30, the cloth 1 (this is the same as the cloth in Fig. 5 etc., so the same numeral is used) and the button fastener 40 in the up-and-down direction when the button 30 is to be fastened to the cloth 1 using the button fastener 40. Fig. 12 shows a state where the cloth 1 is being held between the button 30 being lowered and the post 42 of the button fastener 40. At this time, the cloth 1 is being lifted up relatively by the post 42 of the button fastener 40 and pressed against the lower surface of the flange 32 and a bottom side portion of the inclined inner periphery surface 31b' of the projection proximal portion 31b. At this moment, the cloth 1 is contacting the hollows 35 and the bulges 36 formed on the inclined inner periphery surface 31b' while pressing them, and therefore, the cloth 1 partially penetrates into the hollows 35 while the bulges 36 bite into the cloth 1. Therefore, the cloth 1 receives, in addition to a press by a sharp top 43 of the post 42 of the button fastener 40 from below, presses and tensions or strong and weak presses alternate continuously in the circumferential direction because of the engagement with the hollows 35 and bulges 36 on the upper side of the cloth. That is, parts of the cloth 1 corresponding to the bulges 36 are compressed in a concentrated manner, while parts corresponding to the hollows 35 are relieved from being compressed, making parts of the cloth 1 corresponding to between the bulges 36 and the hollows 35 tense in the radial direction. Therefore, it will be easier to cut the cloth 1 by the button 30 and the post 42 of the button fastener 40 than by a combination of a conventional button with no hollows and bulges and a button fastener, reducing a piercing force or load which the post 42 would receive from the cloth 1 at the time of piercing the cloth. The post 42, after having cut the cloth 1, as with the Fig. 8-related description, goes into the post-fixing space 33 of the button 30 and then is plastically deformed along the inner surface of the projection body 31a and fixed by the narrow part 31c. Thereby, fastening the button 30 to the cloth 1 is completed.

[0026] Fig. 13 shows an illustrative longitudinal sectional view of a decorative button (hereinafter referred to simply as "button") 50 in accordance with another embodiment of the invention. The button 50 comprises a dome-like projection 51, and a flange 52 which rises upward from the proximal end of the projection 51 beyond the top of the projection 51 and then extends radially outward. The flange 52 includes a circularly annular flange body 52a and a connecting portion 52b which connects the flange body 52a to the proximal end of the projection 51 so as to surround the projection 51. Top side of the projection 51 is closed and button side is open as a post-receiving opening 54. The projection 53 defines interiorly a post-fixing space 53 for receiving the post 42 of the button fastener 40 (see Fig. 11) through the post-receiving opening 54 and deforming it to be fixed in the space. Further, the projection 51 includes a projection proximal portion 51b which doubles as a proximal end of the connecting portion 52b. The inner periphery surface (inclined inner periphery surface) 51b' of the projection proximal portion 51b inclines while reducing its diameter toward the top side. On the

inclined inner periphery surface 51 b', there are formed hollows 55 and bulges 56 similar to the hollows 35 and bulges 36 of the male snap button 30 as described above. Therefore, when the button 50 is to be fastened to the cloth 1 using the button fastener 40, it will be easier to cut the cloth 1 by the post 42 of the button fastener 40 with the assistant of the hollows 55 and bulges 56.

[0027] Fig. 14 shows a cutaway perspective view of a post 62 of a button fastener 60 in accordance with another embodiment of the invention. The post 62 includes a distal portion (post distal portion) 62b, the diameter of which expands upward. On the inclined inner periphery surface 62b' of the post distal portion 62b, there are formed hollows 64 and bulges 65 alternately in the circumferential direction, both of which have triangular horizontal section. Further, the top 63 of the post 62 is corrugated with triangular troughs 64' and peaks 65' continuous in the circumferential direction, which correspond to the hollows 64 and bulges 65, respectively. Therefore, when the button 20 is to be fastened to the cloth 1 using the button fastener 60, it will be easier to cut the cloth 1 by the post 62.

[0028] Fig. 15 shows a perspective view from below of a button (male snap button) 70 in accordance with another embodiment of the invention. The button 70 includes a projection 71 having a proximal portion (projection proximal portion) 71b. On the inclined inner periphery surface 71b' of the projection proximal portion 71b, there are formed hollows 75 and bulges 76 alternately in the circumferential direction, both of which have triangular horizontal section. Further, the open end of a post-receiving opening 74 appearing on the lower surface of a flange 72 of the button is corrugated with triangular troughs 74' and peaks 75' continuous in the circumferential direction, which correspond to the hollows 75 and bulges 76, respectively. Therefore, when the button 70 is to be fastened to the cloth 1 using the button fastener 40, it will be easier to cut the cloth 1 by the post 42.

[0029] In the descriptions, the combinations of the button fastener 10, 60 having the hollows 14, 64 and bulges 15, 65 and the button 20 without hollows and bulges, and the combinations of the button 30, 50, 70 having the hollows 35, 55, 75 and bulges 36, 56, 76 and the button 40 without hollows and bulges were explained. However, it is possible to fasten the button 30, 50, 70 having the hollows 35, 55, 75 and bulges 36, 56, 76 to the cloth 1 using the button fastener 10, 60 having the hollows 14, 64 and bulges 15, 65.

DESCRIPTION OF REFERENCE NUMBERS

[0030]

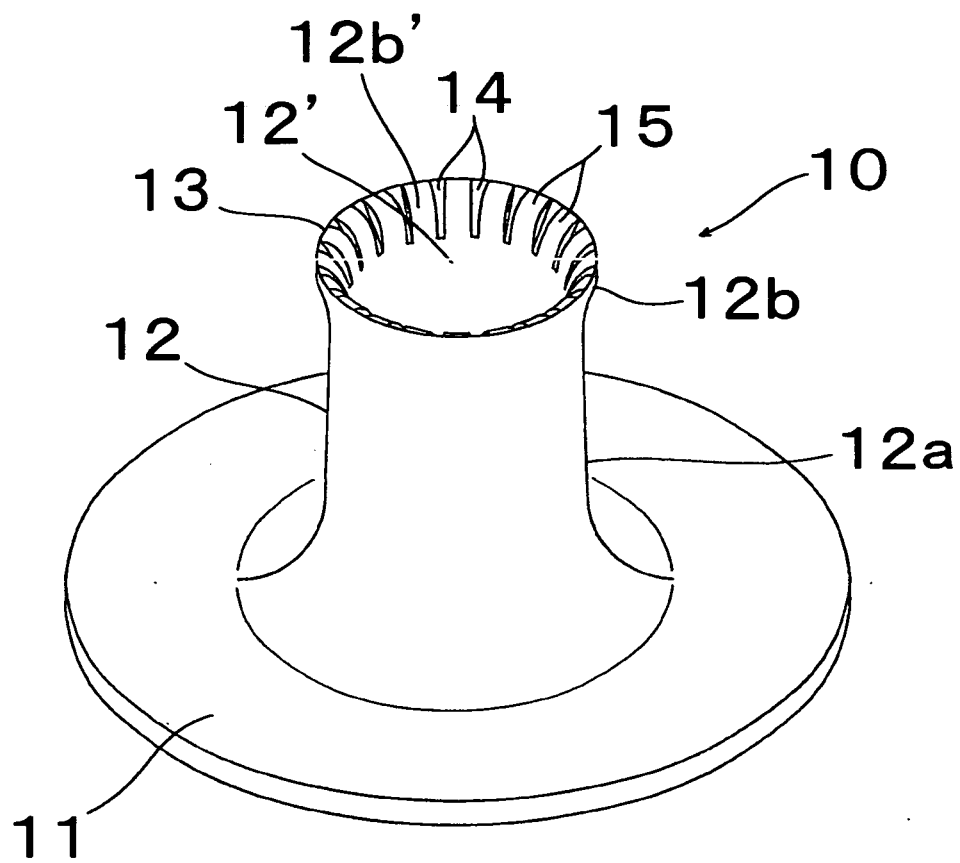
1	cloth
10, 40, 60	button fastener
11, 41	base
12, 42, 62	post
12'	top opening
12"	bottom opening
12b, 62b	post distal portion
12b', 62b'	inner periphery surface (of the post distal portion)
13, 43, 63	top
14, 64	hollow
15, 65	bulge
20, 30, 70	button (male snap button)
50	button (decorative button)
21, 31, 51, 71	projection
21a, 31a	projection body

21b, 31b, 51b, 71b	projection proximal portion
21 b', 31 b', 51 b', 71 b'	inner periphery surface (of the projection proximal portion)
22, 32, 52, 72	flange
23, 33, 53, 73	post-fixing space
24, 34, 54, 74	post-receiving opening
35, 55, 75	hollow
36, 56, 76	bulge

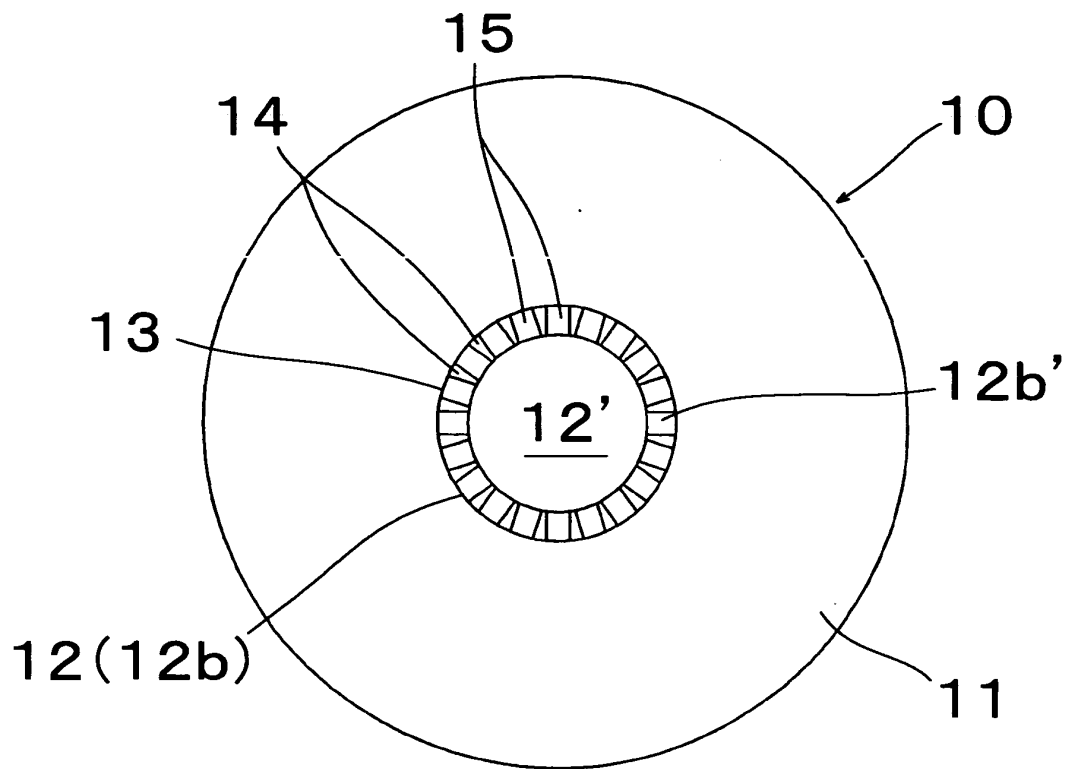
Claims

1. A button fastener (10, 60) for fastening a button (20, 30, 50, 70) to a cloth (1), comprising a plate-like base (11), and a cylindrical post (12, 62) which protrudes from the base (11), wherein, at a distal portion (12b, 62b) of the post (12, 62), a plurality of hollows (14, 64) and a plurality of bulges (15, 65) are formed alternately in the circumferential direction.
2. The button fastener according to claim 1, wherein the distal portion (12b, 62b) of the post (12, 62) includes an inclined inner periphery surface (12b', 62b'), the diameter of which gradually expands toward the top (13, 63) of the post (12, 62), and wherein said hollows (14, 64) and said bulges (15, 65) are formed on the inclined inner periphery surface (12b', 62b').
3. The button fastener according to claim 1, wherein the button (20, 30, 50, 70) includes an projection (21, 31, 51, 71) having a closed distal end and an open proximal end as a post-receiving opening (24, 34, 54, 74), and wherein the projection (21, 31, 51, 71) defines interiorly a post-fixing space (23, 33, 53, 73) for receiving the post (12, 62), which has just pierced the cloth (1), through the post-receiving opening (24, 34, 54, 74) and deforming it to be fixed in the space.
4. A button (30, 50, 70) which is fastened to a cloth (1) using a button fastener (10, 40, 60) including a cylindrical post (12, 42, 62), comprising an projection (31, 51, 71) having a closed distal end and an open proximal end as a post-receiving opening (34, 54, 74), and a flange (32, 52, 72) extending radially outward from the projection (31, 51, 71), wherein the projection (31, 51, 71) defines interiorly a post-fixing space (33, 53, 73) for receiving the post (12, 42, 62), which has just pierced the cloth (1), through the post-receiving opening (34, 54, 74) and deforming it to be fixed in the space, wherein, on an inner periphery surface (31 b', 51 b', 71 b') of a proximal portion (31 b, 51 b, 71 b) of the projection (31, 51, 71), a plurality of hollows (35, 55, 75) and a plurality of bulges (36, 56, 76) are formed alternately in the circumferential direction.
5. The button according to claim 4, wherein the inner periphery surface (31 b', 51 b', 71 b') of the proximal portion (31 b, 51 b, 71 b) of the projection (31, 51, 71) is an inclined inner periphery surface (31b', 51b', 71b'), the diameter of which gradually reduces toward the distal end side of the projection (31, 51, 71), and wherein said hollows (35, 55, 75) and said bulges (36, 56, 76) are formed on the inclined inner periphery surface (31b', 51b', 71b').
6. The button according to claim 4 or 5, wherein the button (30, 50, 70) is a male snap button (30, 70) or a decorative button (50).

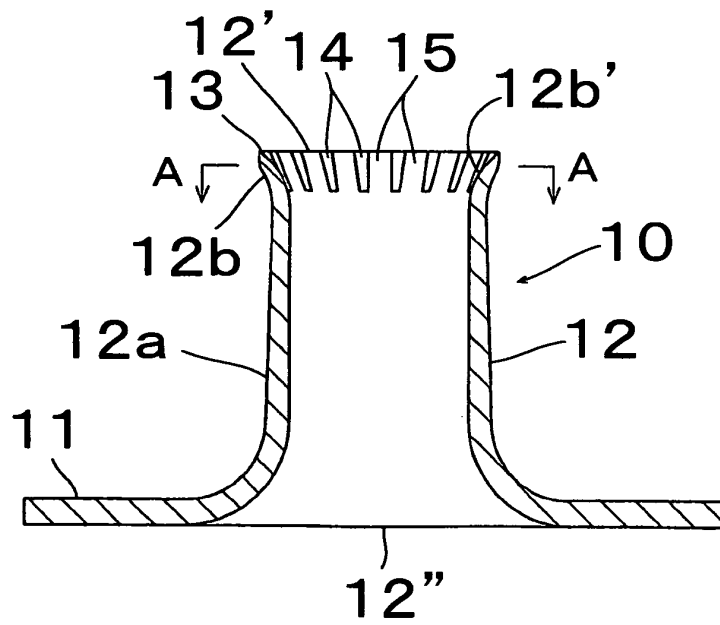
【FIGURE 1】



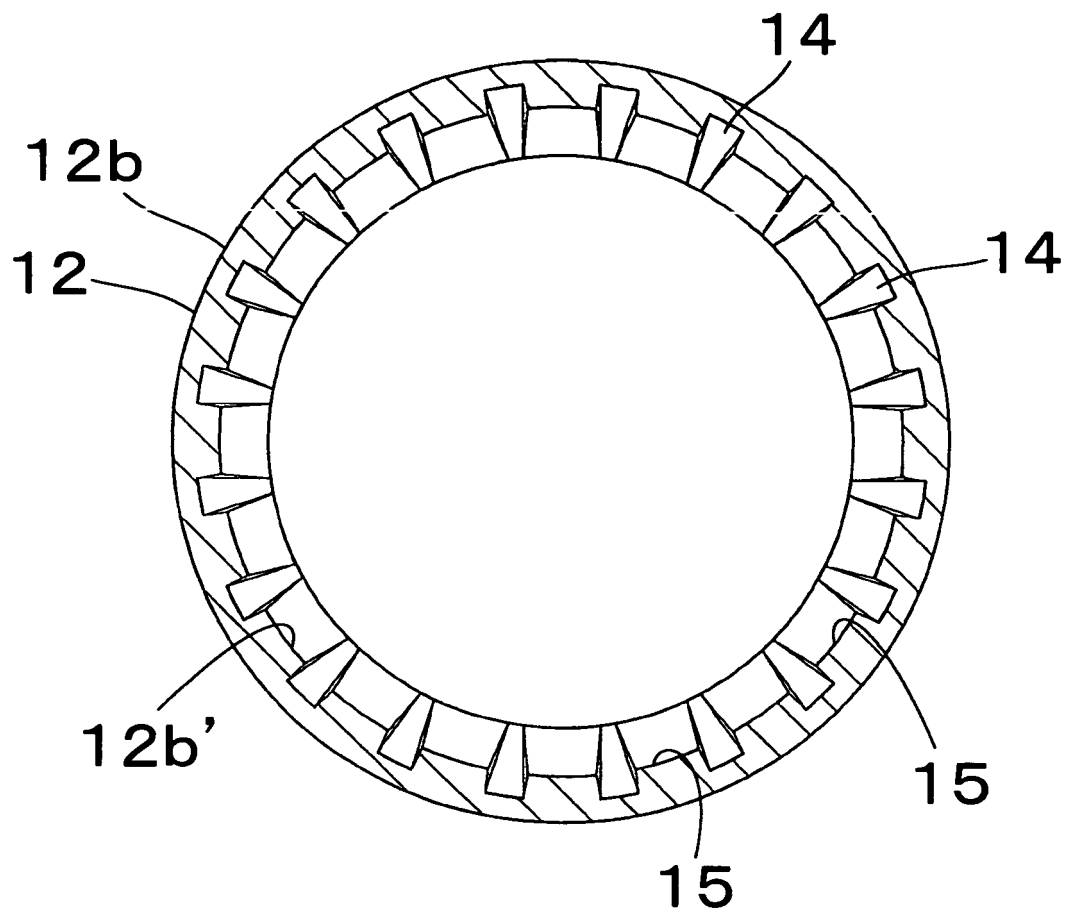
【FIGURE 2】



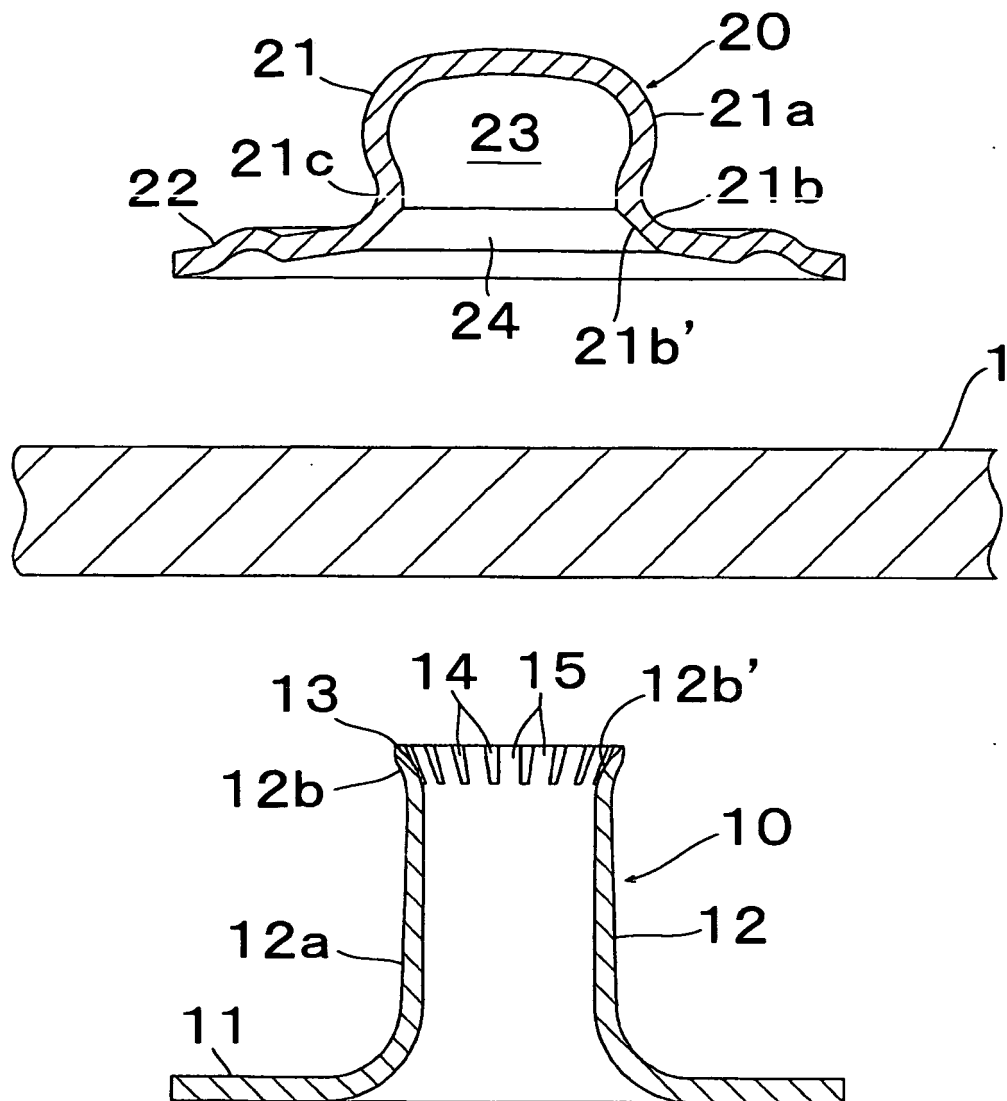
【FIGURE 3】



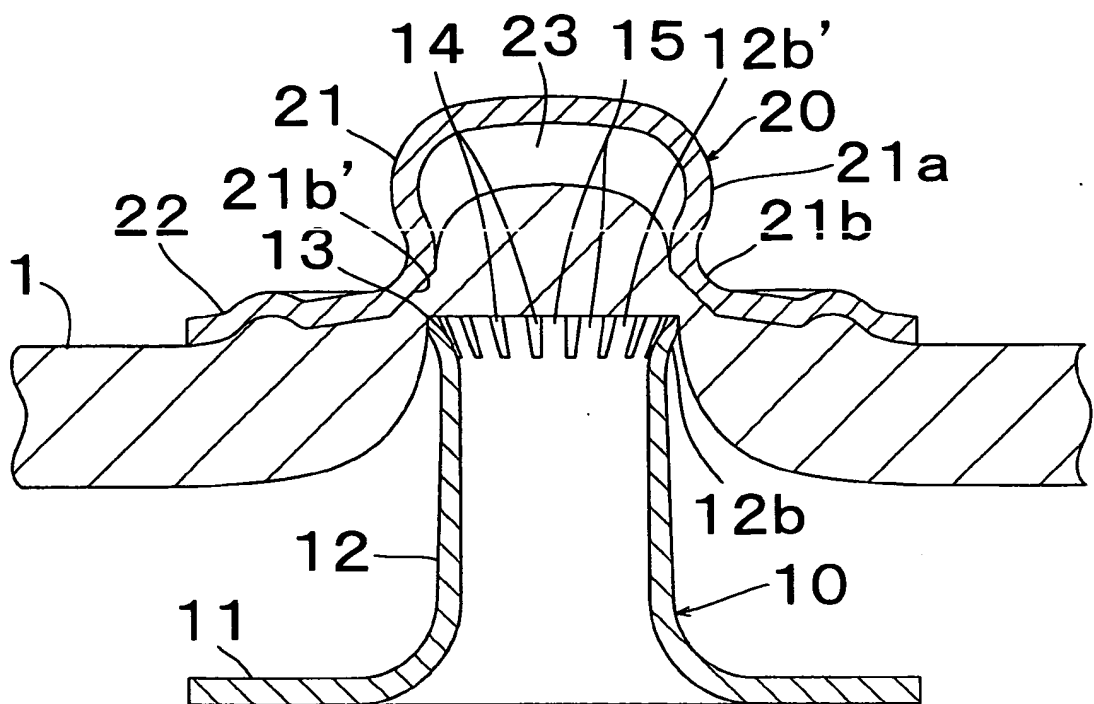
【FIGURE 4】



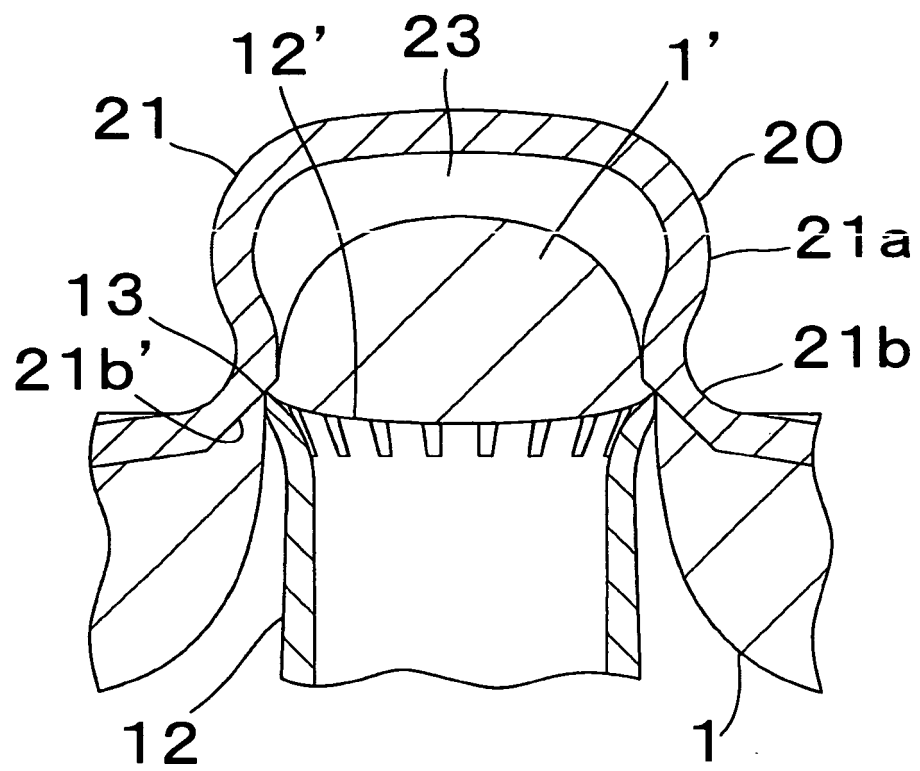
【FIGURE 5】



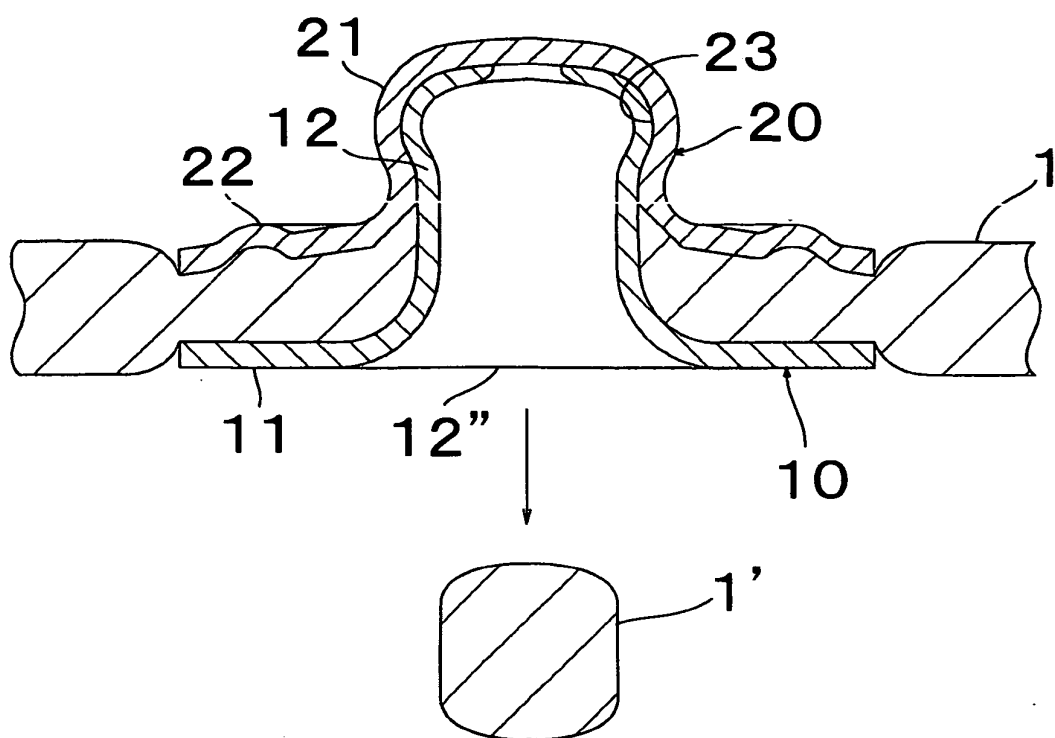
【FIGURE 6】



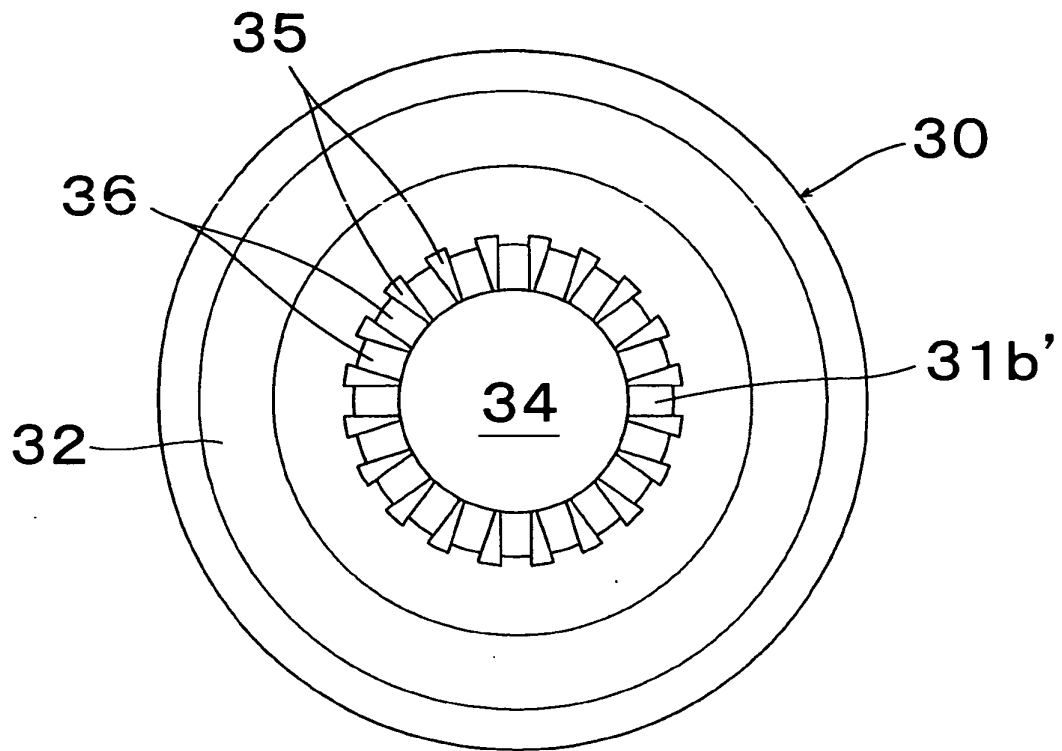
【FIGURE 7】



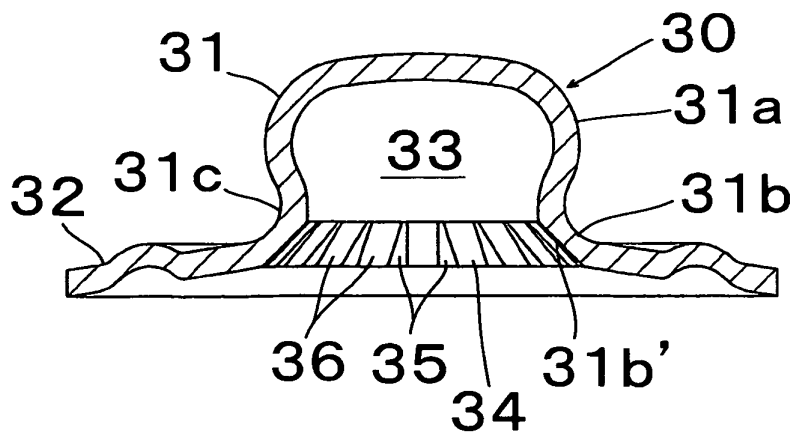
【FIGURE 8】



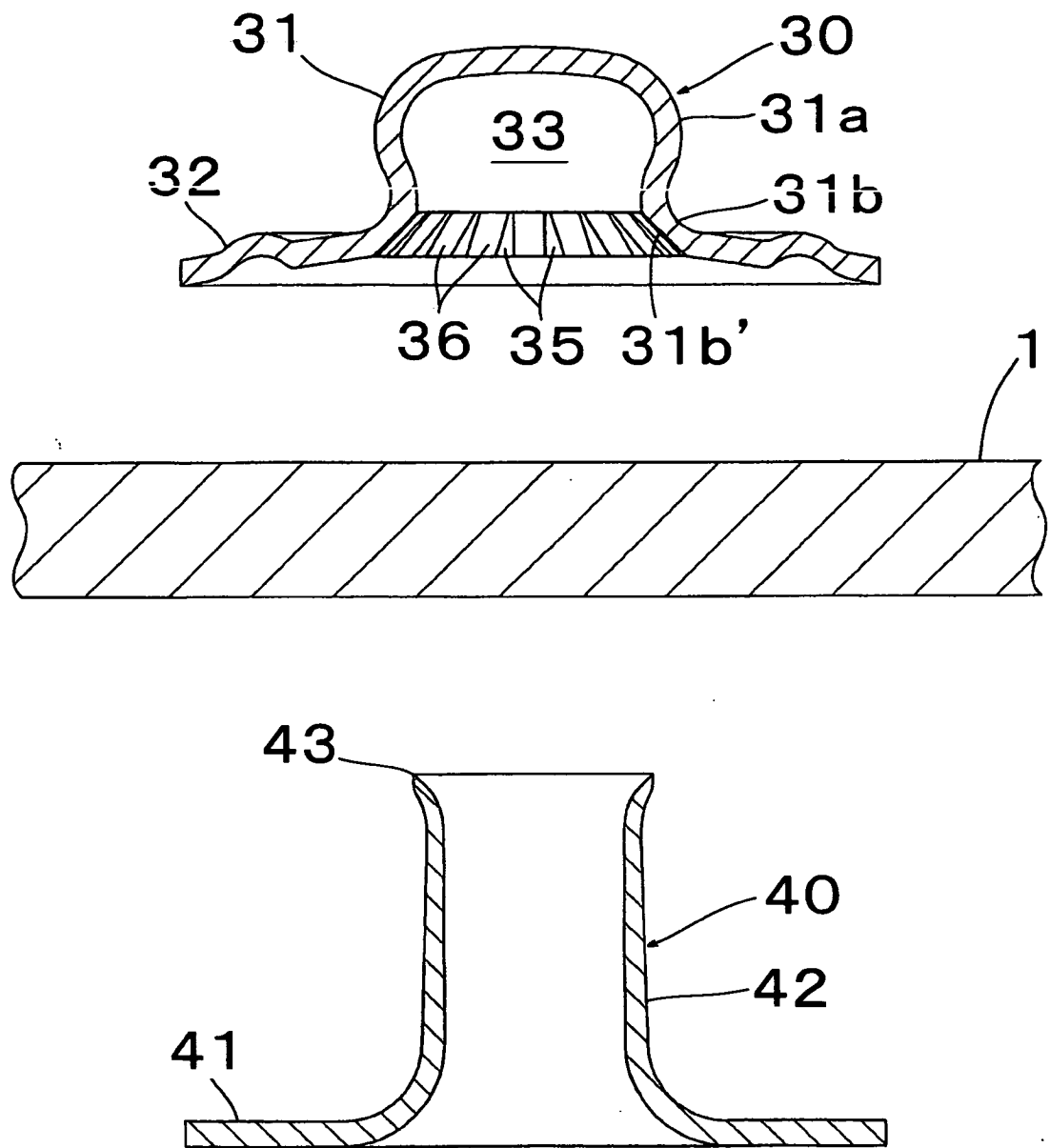
【FIGURE 9】



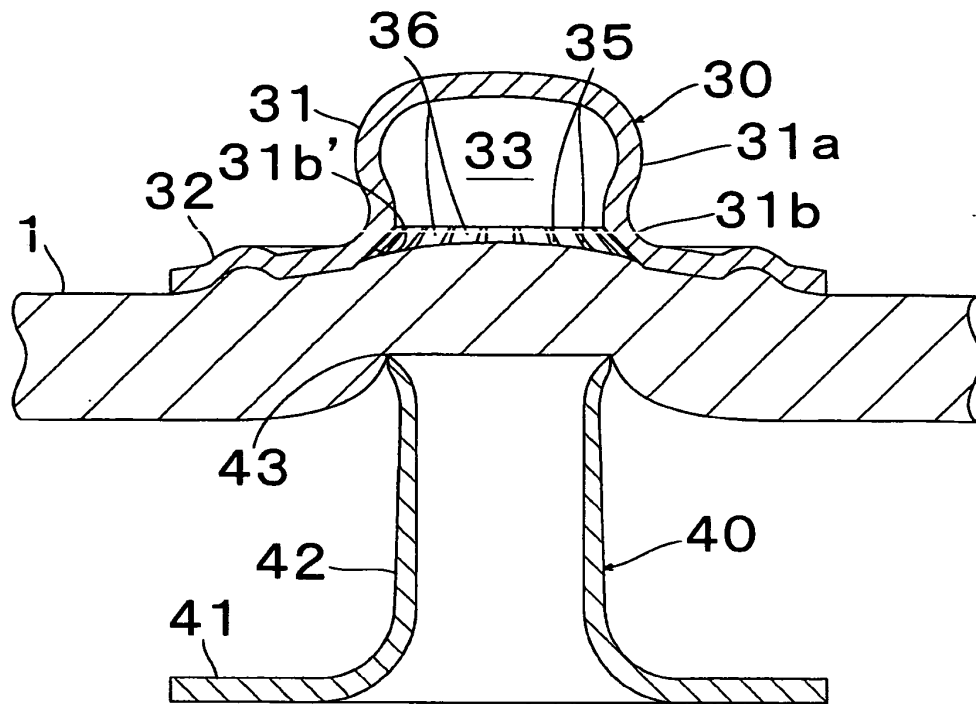
【FIGURE 10】



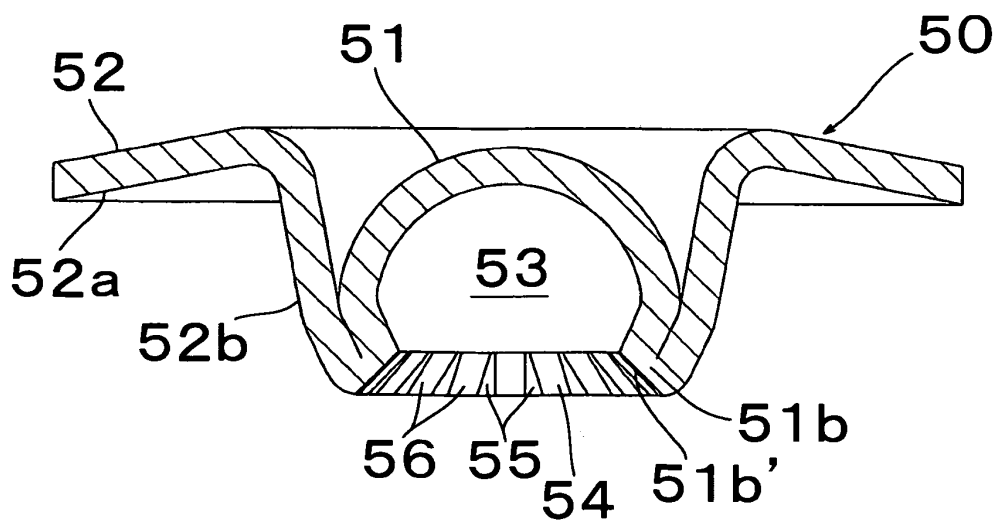
【FIGURE 1 1】



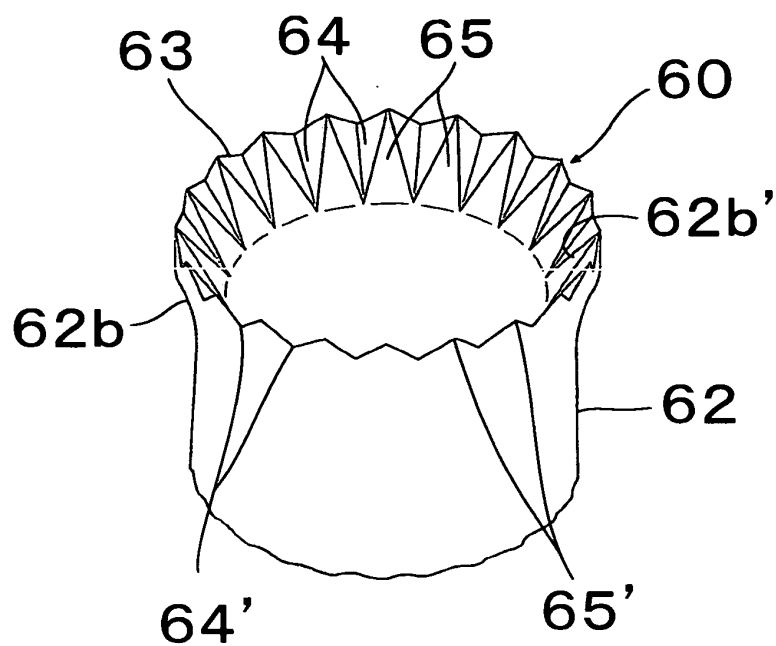
【FIGURE 1 2】



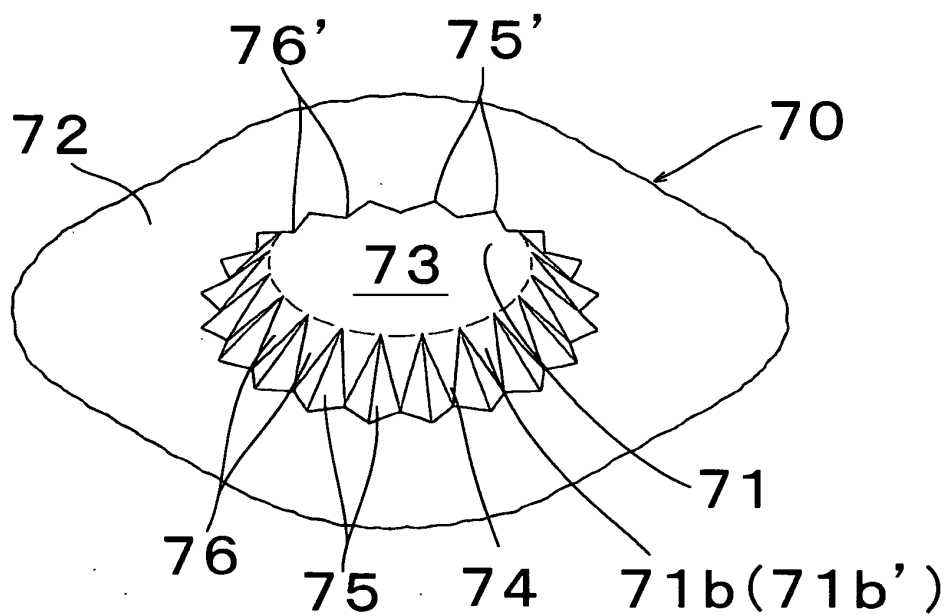
【FIGURE 1 3】



【FIGURE 1 4】



【FIGURE 1 5】



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2010/050290

A. CLASSIFICATION OF SUBJECT MATTER

A44B1/18(2006.01) i, A44B1/06(2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A44B1/18, A44B1/06

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2010
Kokai Jitsuyo Shinan Koho	1971-2010	Toroku Jitsuyo Shinan Koho	1994-2010

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 59-169637 A (Nippon Notion Kogyo Co., Ltd.), 25 September 1984 (25.09.1984), page 2, upper right column, line 15 to lower left column, line 6; fig. 1 (Family: none)	1, 3
X Y	JP 30-930 Y1 (San'ei Kinzoku Kogyo Kabushiki Kaisha), 26 January 1955 (26.01.1955), entire text; all drawings (Family: none)	1, 3 2

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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Date of the actual completion of the international search
06 April, 2010 (06.04.10)Date of mailing of the international search report
20 April, 2010 (20.04.10)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 41404/1987 (Laid-open No. 148205/1988) (Morito Co., Ltd.), 29 September 1988 (29.09.1988), specification, page 5, lines 12 to 17; fig. 1 (Family: none)	2
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 107935/1985 (Laid-open No. 16307/1987) (Kabushiki Kaisha Hisanaga Seisakusho), 31 January 1987 (31.01.1987), specification, page 3, lines 2 to 6; fig. 1 (Family: none)	2
X	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 10807/1986 (Laid-open No. 123109/1987) (Kabushiki Kaisha Hisanaga Seisakusho), 05 August 1987 (05.08.1987), specification, page 1, line 19 to page 2, line 11; fig. 4 (Family: none)	4-6
X	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 161765/1983 (Laid-open No. 69008/1985) (Nippon Notion Kogyo Co., Ltd.), 16 May 1985 (16.05.1985), specification, page 12, line 13 to page 13, line 3; fig. 11 to 12 (Family: none)	4, 6

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Patent documents cited in the description

- US 3351987 A [0002] [0004]