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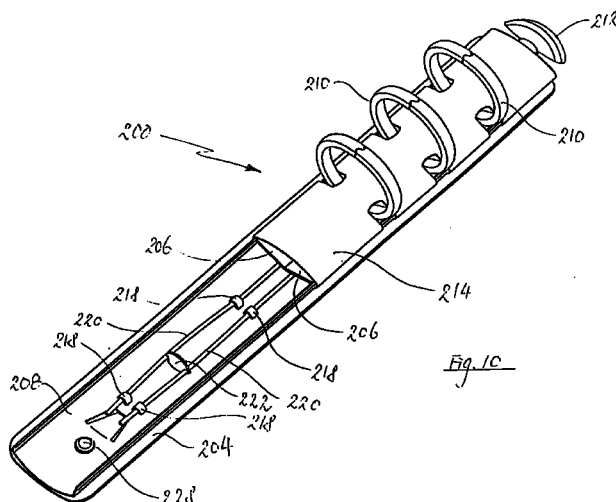
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(54) **A ring binder mechanism**

(57) There is provided a ring binder mechanism 200, 300 including a back plate 204 and two carrier plates 206 which are arranged in a resilient lower plate 208 and bear against each other, the angle formed between the carrier plates 206 changing during opening and closing of half-ring members 210 associated mounted on the carrier plates 206, the back plate 204 being adapted to be secured to an article, e.g. a cover,

in which the back plate 204 is securable with the lower plate 208 in a snap-fit manner. The back plate 204 may be secured to an article, e.g. a cover, at least part of which is between the back plate 204 and the lower plate 208, in which the lower plate 208 includes two resilient tongue members 234 extending generally towards the back plate 204.



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Description

[0001] This invention relates to a ring binder mechanism and, in particular, such a mechanism which can be secured to an article, e.g. a cover, to form a pocket diary or organizer for retaining loose-leaf paper.

Background of the Invention

[0002] Figs. 1 to 2C show a first type of prior art ring binder mechanism (generally designated as 10), which may be used in such stationery items as ring binders and pocket diaries. The ring binder mechanism 10 includes a retaining structure 12 and a back plate 14. At each end of the retaining structure 12 is a lever 16, which is operable to open and/or close a number of half-rings 18, in the well known manner.

[0003] The retaining structure 12 includes a pair of plates 20 (to which the half-rings are mounted) supported by a lower curved plate 22. A respective longitudinal edge of the plates 20 abuts each other so that the pair of plates 20 may pivot relative to each other in the usual manner. The lower curved plate 22 includes two cut-out portions 24a, 24b. Each of the cut-out portions 24a, 24b includes a narrower generally rectangular portion and a broader generally rectangular portion. The cut-out portion 24a includes a tongue 26 with a recess 28 on its side facing the back plate 14.

[0004] As shown more clearly in Fig. 2C, the back plate 14 includes two pairs of lugs 30. The two lugs 30 of the same pair are bent outward from each other. A ridge 32 is also provided on the upper surface of the back plate 14.

[0005] The retaining structure 12 and the back plate 14 are assembled to each other in the following manner. The longitudinal axis of the retaining structure 12 and that of the back plate 14 are disposed substantially parallel to each other, whereby the recess 28 of the tongue 26 slides on and relative to the ridge 32 in the direction indicated by the arrow K. When the tongue 26 passes over the ridge 32, the lower curved plate 22 will then be engaged with the back plate 14 in the manner as shown in Fig. 1. As can be seen, the lugs 30 prevent (a) the curved lower plate 22 from moving any further relative to the back plate 14 in the direction of the arrow K, or (b) the curved lower plate 22 from being pulled apart from the back plate 14. The engagement between the tongue 26 and the ridge 32 also prevents the curved lower plate 22 from moving relative to the back plate 14 in the direction opposite to the arrow K. By way of such an arrangement, the curved lower plate 22, and thus the retaining structure 12, is locked with the back plate 14 against any relative movement therebetween.

[0006] A second type of prior art ring binder mechanism is shown in Figs. 3A to 6E, and generally designated as 100. As in the case of the first type of prior art ring binder mechanism 10 discussed above, the second type of prior art ring binder mechanism 100 includes a

curved lower plate 102 supporting a pair of plates 104 (shown in broken lines in Fig. 4) which are pivotable relative to each other in order to open and/or close half-rings 106, upon operation of levers 108.

[0007] As shown in Fig. 4, the ring binder mechanism 100 includes a generally curved back plate 110 (see Figs. 5A and 5B) to which two upstanding barrels 112 (of which only one is shown in Fig. 4) are secured. Secured to the upper surface of the curved lower plate 102 is a pair of claw rings 114. As can be seen, the claw ring 114 includes a generally circular ring portion 116 which is engaged by a lip portion 118 of the curved lower plate 102. The claw ring 114 also includes five claw members 120 which extend generally upwardly away from the ring portion 116. A central opening 122 is thus formed in the central portion.

[0008] As can be seen in Figs. 4, 6C and 6D, the curved lower plate 102 may be assembled to and engaged with the back plate 110 by first aligning the central opening 122 of each of the claw rings 114 over the respective barrel 112, and subsequently pushing the curved lower plate 102 towards the back plate 110 in the direction indicated by the arrow L in Fig. 6C, whereby the claw members 120 will grip the respective barrel 112, and prevent any relative movement between the curved lower plate 102 and the back plate 110. Because of the orientation of the claw members 120, once the curved lower plate 102 is engaged with the back plate 110 in the manner as shown in Figs. 4, 6C and 6D, any attempt to pull the curved lower plate 102 away from the back plate 110 in the direction opposite to the arrow L in Fig. C will only tighten the grip of the claw members 120 on the barrels 112, thus preventing the attempt to pull the curved lower plate 102 away from the back plate 110.

[0009] A disadvantage associated with the first type of prior art ring binder mechanism 10 is that, during assembling, it is necessary to accurately align the retaining structure 12 with the back plate 14 in order to assemble them together. In addition, as mentioned above, it is common to adopt such a ring binder mechanism in pocket diaries and organizers, in which the back plate 14 is secured to and embedded in the cover of the pocket diary or organizer. The cover may be made of such materials as genuine leather, imitation leather, cardboard materials, plastics materials etc., which are of different thickness, according to the nature of the materials as well as the size of the pocket diary. Accordingly, a sheet of material of different thickness may have to be disposed between the back plate 14 and the curved lower plate 22 of the respective prior art ring binder mechanisms 10. In order to cater for this situation, the manufacturers have to provide the assemblers with products or components of various sizes, thus increasing the complication of the assembling process.

[0010] As to the second type of prior art ring binder mechanism 100, since the barrels 112 and claw rings 114 must be fixed to the back plate 110 and the curved

lower plate 102 respectively, the production procedure is rather complicated, which leads to an increase in the cost of the product.

[0011] It is thus an object of the present invention to provide a ring binder mechanism in which the above shortcomings are mitigated, or at least to provide a useful alternative to the trade and public.

[0012] It is a further object of the present invention to provide a ring binder mechanism which is easy to assemble, thus allowing easy and ready mass production by machines.

[0013] It is a yet further object of the present invention to provide a ring binder mechanism which can cater for covers made of materials of different thickness.

Summary of the Invention

[0014] According to a first aspect of the present invention, there is provided a ring binder mechanism including a base plate and two carrier rails, wherein said carrier rails are arranged in a resilient casing member and bear against each other, the angle formed between said carrier rails changing during opening and closing of half ring members associated with said carrier rails, said base plate being adapted to be secured to an article, wherein said base plate is securable with said casing member in a snap-fit manner.

[0015] According to a second aspect of the present invention, there is provided a ring binder mechanism including a base plate and two carrier rails, wherein said carrier rails are arranged in a resilient casing member and bear against each other, the angle formed between said carrier rails changing during opening and closing of half ring members associated with said carrier rails, wherein said base plate is engageable with said casing member, wherein said base plate is adapted to be secured to an article at least part of which being disposed between said base plate and said casing member, wherein said base plate includes at least one resilient member extending generally towards said casing member, or wherein said casing member includes at least one resilient member extending generally towards said base plate.

Brief Description of the Drawings

[0016]

Fig. 1 is a partially cut-away top perspective view of a first type of prior art ring binder mechanism;
Fig. 2A is bottom perspective view of an upper part of the ring binder mechanism shown in Fig. 1;
Fig. 2B is a top perspective view of the upper part of the ring binder mechanism shown in Fig. 2A;
Fig. 2C is a top perspective view of a base plate of the ring binder mechanism shown in Fig. 1;
Fig. 3A is a side view of a second type of prior art ring binder mechanism (not showing the base

plate);

Fig. 3B is a top view of the ring binder mechanism shown in Fig. 3A;

Fig. 3C is a cross sectional view along the line A-A of the ring binder mechanism shown in Fig. 3A;

Fig. 4 shows the cross sectional view of Fig. 3C in an enlarged scale and with the base plate shown;

Fig. 5A is a top view of the base plate used in the ring binder mechanism shown in Fig. 3A;

Fig. 5B is a cross sectional view along the line B-B of the base plate shown in Fig. 5A;

Fig. 6A is a partially cut-away side view showing the engagement between the casing member and the base plate of the ring binder mechanism shown in Fig. 3A;

Fig. 6B is a top view of the engagement between the casing member and the base plate shown in Fig. 6A;

Fig. 6C is a cross sectional view along the line C-C in Fig. 6A;

Fig. 6D shows in an enlarged scale the cut-away portion shown in Fig. 6A;

Fig. 6E shows an engaging ring used in the ring binder mechanism shown in Fig. 3A;

Fig. 7 shows a top perspective view of a ring binder mechanism according to a first embodiment of the present invention;

Fig. 8A is a side view of the ring binder mechanism shown in Fig. 7 (not showing the base plate);

Fig. 8B is a top view of the ring binder mechanism shown in Fig. 8A;

Fig. 8C is a cross-sectional view along the line D-D of the ring binder mechanism shown in Fig. 8B;

Fig. 9 shows the ring binder mechanism in Fig. 7 with the components fully disassembled;

Fig. 10 shows a partially cut-away top perspective view of the ring binder mechanism shown in Fig. 7;

Fig. 11A shows a top perspective view of a back plate used in the ring binder mechanism shown in Fig. 7;

Fig. 11B is a longitudinal cross sectional view of the back plate shown in Fig. 11A;

Fig. 11C is a top view of the back plate shown in Fig. 11A;

Fig. 11D is a cross sectional view along the line E-E of the back plate shown in Fig. 11B;

Fig. 11E is a cross sectional view along the line F-F of the back plate shown in Fig. 11B;

Fig. 12A is a top perspective view showing the engagement between the casing member and the engagement wires of the ring binder mechanism shown in Fig. 10;

Fig. 12B is a bottom perspective view of the casing member shown in Fig. 12A;

Fig. 12C is a top view of the engagement between the casing member and the engagement wires shown in Fig. 12A;

Fig. 12D is a cross sectional view along the line I-I

shown in Fig. 12C;

Fig. 12E is a cross sectional view along the line G-G shown in Fig. 12D;

Fig. 13 shows a second embodiment of a ring binder mechanism according to the present invention with the components fully disassembled;

Fig. 14A is a top view of the engagement between the casing member and the engagement wires shown in Fig. 13;

Fig. 14B is a bottom perspective view of the casing member shown in Fig. 14A;

Fig. 14C is a top view of the engagement between the casing member and the engagement wires shown in Fig. 14A;

Fig. 14D is a cross sectional view along the line J-J shown in Fig. 14C;

Fig. 14E is a cross sectional view along the line H-H shown in Fig. 14D;

Fig. 15A is an exploded cross sectional view showing the engagement between the back plate and the casing member of the ring binder mechanism shown in Fig. 10;

Fig. 15B shows the back plate and the casing member of the ring binder mechanism shown in Fig. 10 as fully engaged;

Fig. 16A is a partial longitudinal cross sectional view showing the engagement of the back plate with the casing member of the ring binder mechanism shown in Fig. 10, with a first article in between;

Fig. 16B shows a transverse cross sectional view of the ring binder mechanism shown in Fig. 16A;

Fig. 16C is a partial longitudinal cross sectional view showing the engagement of the back plate with the casing member of the ring binder mechanism shown in Fig. 10, with a second article in between; and

Fig. 16D shows a transverse cross sectional view of the ring binder mechanism shown in Fig. 16C.

Detailed Description of the Preferred Embodiments

[0017] A first embodiment of a ring binder mechanism according to the present invention is shown in Fig. 7 to 9 as generally designated as 200. The ring binder mechanism 200 includes a structure 202 for retaining loose-leaf paper, and a curved back plate 204.

[0018] Referring first to the retaining structure 202, such includes a pair of elongate carrier plates 206 which abut each other along one of their respective lateral edges. The elongate plates 206 are supported by a resilient curved lower plate 208. Mounted with each of the plates 206 are a number of half-ring members 210. By way of such an arrangement, on operation of a pair of levers 212, the plates 206 may be caused to pivot to open and/or close the pairs of half-ring members 210, during which the angle formed between the elongate plates 206 changes, as in the usual manner. To

enhance the appearance of the ring binder mechanism 200, a curved upper cover 214 is also provided. The upper cover 214 includes a number of side openings 216 through which the half-ring members 210 may extend. As shown more clearly in Figs. 9 and 10, the curved lower plate 208 includes two rows of loops 218, through each row a wire 220 may be received.

[0019] Figs. 11A to 11E, show various views of the curved back plate 204. It can be seen that two lug members 222, which are integral with the back plate 204, extend generally upwardly from the back plate 204. As can be seen more clearly in Fig. 11D, the lug member 222 includes a semi-circular upper portion 224 with a rectangular lower portion 226, which is joined with the back plate 204. On the upper surface of the back plate 204 are provided two cylindrical protrusions 228.

[0020] Figs. 12A to 12E show in more detail the engagement between the wires 220 and the curved lower plate 208. Turning in particular to Fig. 12B, it can be seen that the lower plate 208 includes two openings 230 through which the lug members 222 are receivable. For better alignment between the curved lower plate 208 and the back plate 204, the lower plate 208 includes two apertures 232 for receiving the cylindrical protrusions 228, as shown in Fig. 10. Two resilient and generally trapezoidally-shaped tongue members 234, which are integrally formed with the back plate 204, extend generally towards each other and away from the bottom surface of the back curved lower plate 208. The function of these tongue members 234 will be explained below.

[0021] To assemble the retaining structure 202 to the back plate 204, the retaining structure 202 is placed above the back plate with their respective longitudinal axis disposed substantially parallel to each other, with the openings 230 above the respective lug members 222, and with the apertures 232 over the respective cylindrical protrusion 228. When the retaining structure 202 is pushed downwardly towards the back plate 204, the region of the wires 220 acted upon the semi-circular portion 224 of the lug member 228 will be forced to move apart from each other. However, once the wires 220 pass through the semi-circular portion 224, they will snap back and grip on the rectangular portion 226 of the lug member 228. By way of such an arrangement, the retaining structure 202 can be easily and safely secured to the back plate 204 in a snap-fit manner.

[0022] Returning to Fig. 9, it can also be seen that along the inner edges of the elongate plates 206 are provided with recesses 236. In particular, the respective recesses 236 of the plates 206 form a continuous opening which allow the respective lug member 222 to pass through when the half-ring members 210 are in the closed configuration.

[0023] Figs. 13 to 14E show a second embodiment of a ring binder mechanism according to the present invention as generally designated as 300. While most of the construction and components of this ring binder

mechanism 300 are essentially the same as those of the ring binder mechanism 200, it can be seen that, instead of two long wires, four shorter wires 302. It can be readily realized that the mode of operation of the ring binder mechanism 300 is very much the same as that of the ring binder mechanism 200, such that no further elaboration thereof is believed not necessary.

[0024] As mentioned above, and using the ring binder mechanism 200 as the example, the back plate 204 is usually embedded in the cover of the ring binder or pocket diary. In particular, a sheet of material is disposed between the back plate 204 and the retaining structure 202. Figs. 15A and 15B show the engagement between the back plate 204, the retaining structure 202 and a sheet of material 238, e.g. leather. As can be seen in Fig. 15A, the sheet of material 238, which contains an opening 240, is placed between the retaining structure 202 and the back plate 204. When the retaining structure 202 moves towards the back plate 204 in the direction of the arrows N, the lug member 222 extends through the opening 240 and into the interior cavity formed by the upper casing 214 and the lower plate 208 of the retaining structure, and be locked by the wires 220. Fig. 15B shows the retaining structure 202, the sheet of material 238 and the back plate 204 as secured to one another.

[0025] As mentioned above, the curved lower plate 208 includes tongue members 234 which extend towards each other and away from the lower surface of the lower plate 208. The tongue members 234 assist in allowing the ring binder mechanism 200 in catering for materials of different thickness. Figs. 16A and 16B show the attachment of the ring binder mechanism 200 to a thinner material 238a. It can be seen that the tip portion of the tongue member 234 abuts against the material 238a. On the other hand, Figs. 16C and 16D show the attachment of the ring binder mechanism 200 to a thicker material 238b. While the tip portion of the tongue member 234 also abuts against the material 238b, the tongue member 234 is caused by the material 238b to deform and move closer towards the lower surface of the lower plate 208. It can be seen that the retaining structure 202, the back plate 204 and the sheet material 238, 238a, 238b can be safely secured to one another irrespective of the thickness of the sheet material 238, 238a, 238b.

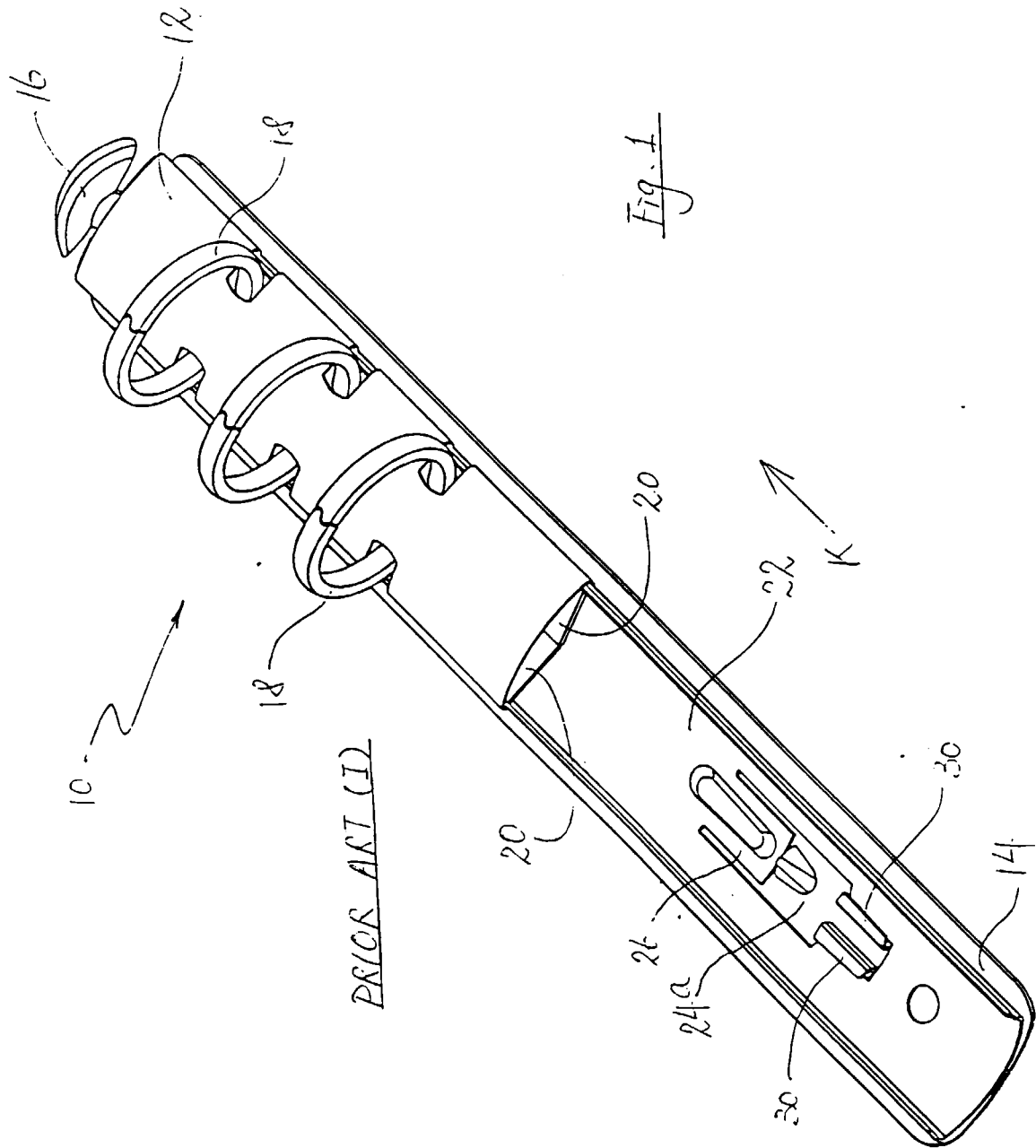
[0026] While the ring binder mechanism 200 is used as the example in explaining the way in which the ring binder mechanism of the present invention may cater for materials of different thickness, it should of course be understood that the ring binder mechanism 300 can also achieve the same result.

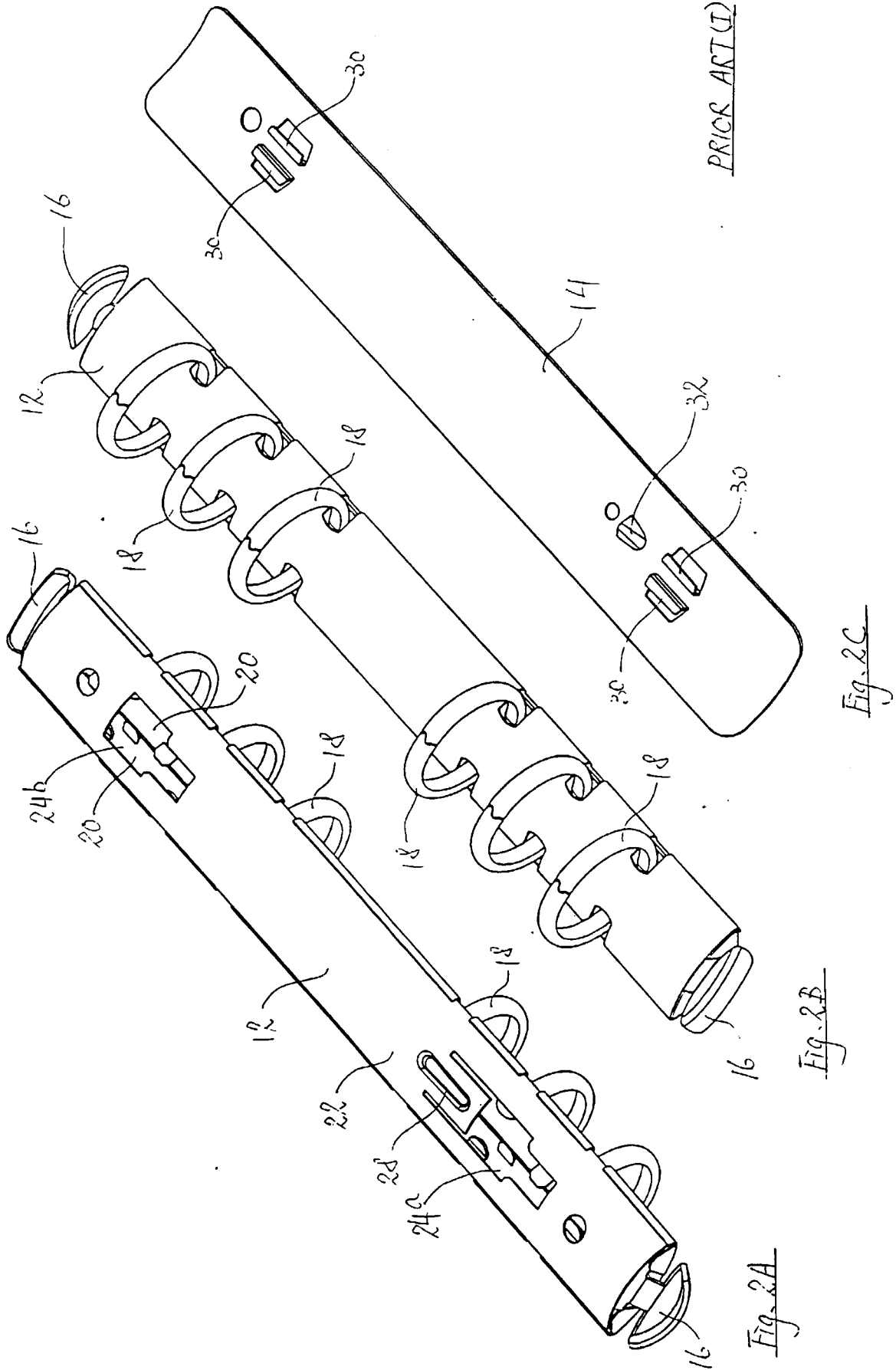
[0027] It should also be understood that the same result can be achieved by providing two integrally formed resilient tongue members on the upper surface of the back plate 204, which extend towards each other and upwardly towards the retaining structure 202.

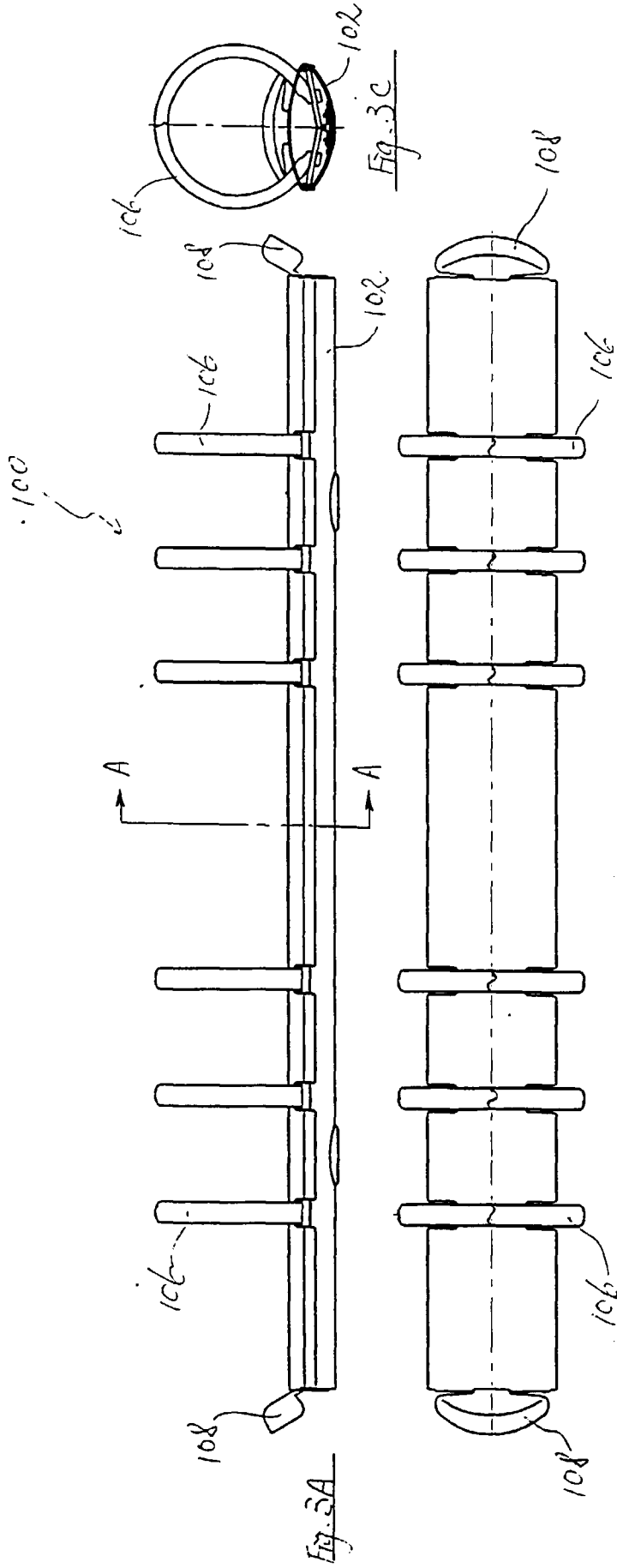
Claims

1. A ring binder mechanism including a base plate and two carrier rails, wherein said carrier rails are arranged in a resilient casing member and bear against each other, the angle formed between said carrier rails changing during opening and closing of half ring members associated with said carrier rails, said base plate being adapted to be secured to an article, wherein said base plate is securable with said casing member in a snap-fit manner.
2. A mechanism according to Claim 1 wherein said base plate includes at least one protrusion member which is engageable with at least one wire member associated with said casing member.
3. A mechanism according to Claim 2 wherein said base plate includes at least two protrusion members.
4. A mechanism according to Claim 2 or 3 wherein each or the protrusion member is engageable with at least two wire members.
5. A mechanism according to any one of Claims 2 to 4 wherein the casing member is associated with at least two wire members.
6. A mechanism according to Claim 5 wherein the casing member is associated with at least four wire members.
7. A mechanism according to any one of Claims 2 to 6 wherein the casing member includes means for securing the wire member(s) thereto.
8. A mechanism according to Claim 7 wherein said securing means is formed integrally with said casing member.
9. A mechanism according to any one of Claims 5 to 8 wherein the wire members are substantially parallel to each other.
10. A mechanism according to any of the preceding claims wherein the protruding member(s) is/are integrally formed with said base plate.
11. A mechanism according to any of Claims 2 to 10 wherein said casing member includes at least one aperture for receiving therethrough at least part of said protruding member.
12. A mechanism according to any one of Claims 2 to 11 wherein at least one of said carrier rails includes at least one opening for receiving therethrough at least part of said protruding member.

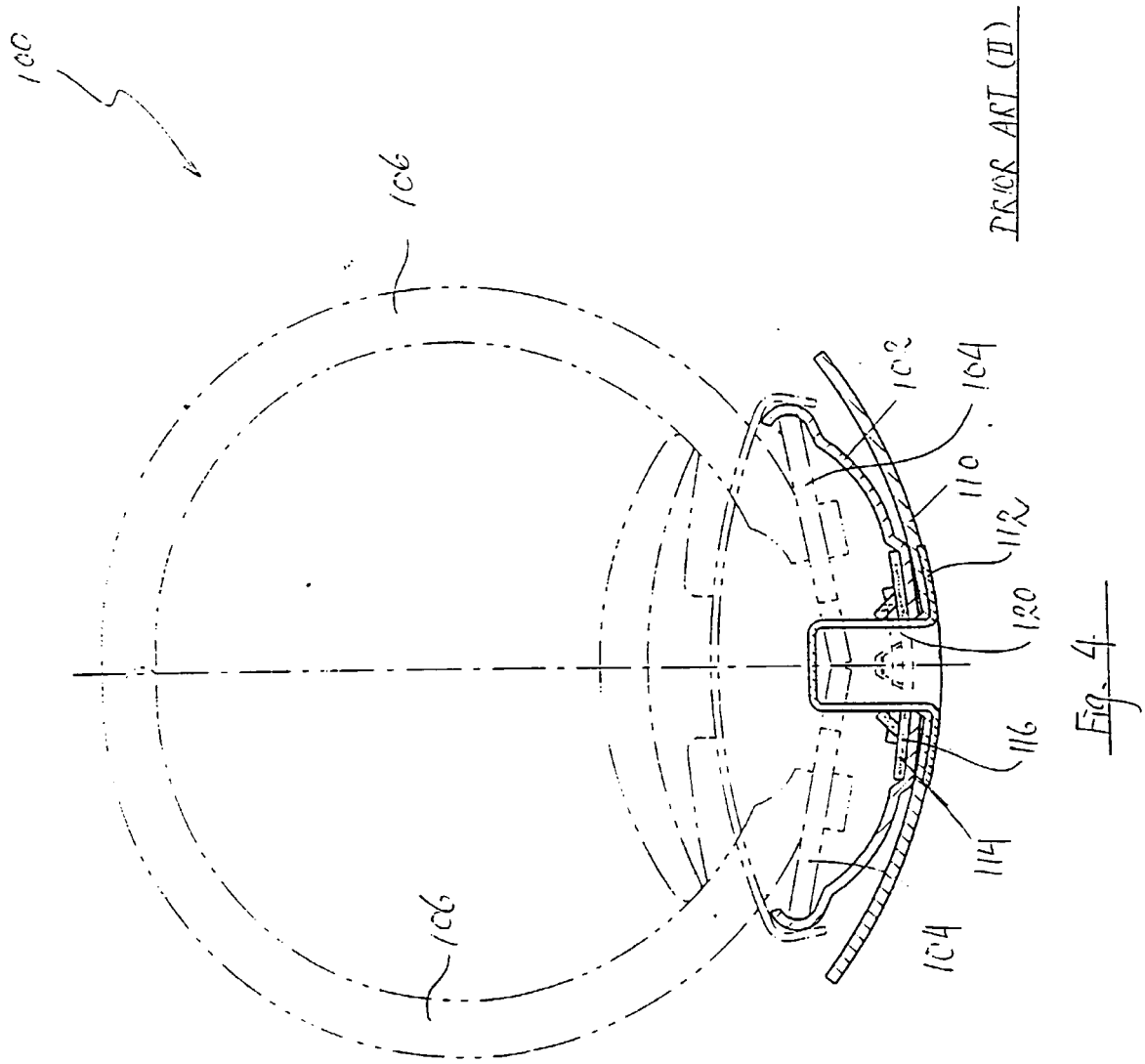
13. A mechanism according to Claim 12 wherein both carrier rails include a respective opening which combine to form a continuous opening for receiving therethrough at least part of said protruding member. 5
14. A mechanism according to any of the preceding claims further including means operable to open and/or close said half ring members. 10
15. A ring binder mechanism including a base plate and two carrier rails, wherein said carrier rails are arranged in a resilient casing member and bear against each other, the angle formed between said carrier rails changing during opening and closing of half ring members associated with said carrier rails, wherein said base plate is engageable with said casing member, wherein said base plate is adapted to be secured to an article at least part of which being disposed between said base plate and said casing member, wherein said base plate includes at least one resilient member extending generally towards said casing member, or wherein said casing member includes at least one resilient member extending generally towards said base plate. 15
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16. A mechanism according to Claim 15 wherein said base plate includes said at least one resilient member extending generally towards said casing member, and wherein said resilient member is formed integrally with said base plate. 30
17. A mechanism according to Claim 15 or 16 wherein said base plate includes at least two resilient members extending generally towards said casing member. 35
18. A mechanism according to Claim 15 wherein said casing member includes said at least one resilient member extending generally towards said base plate, and wherein said resilient member is formed integrally with said casing member. 40
19. A mechanism according to Claim 15 or 16 wherein said casing member includes at least two resilient members extending generally towards said base plate. 45
20. A mechanism according to any one of Claims 15 to 19 wherein said resilient member is substantially trapezoidal in shape. 50
21. A mechanism according to Claim 17 or 19 wherein said two resilient members extend generally towards each other. 55
22. A mechanism according to any one of Claims 15 to 21 wherein said resilient member(s) is/are deformable upon engagement between said casing member and said base plate.
23. A mechanism according to Claim 22 wherein said resilient member(s) is/are deformable in response to the thickness of the part of said article which is between said base plate and said casing member.
24. A mechanism according to any one of Claims 15 to 23 further including means operable to open and/or close said half ring members.







PRIOR ART (II)



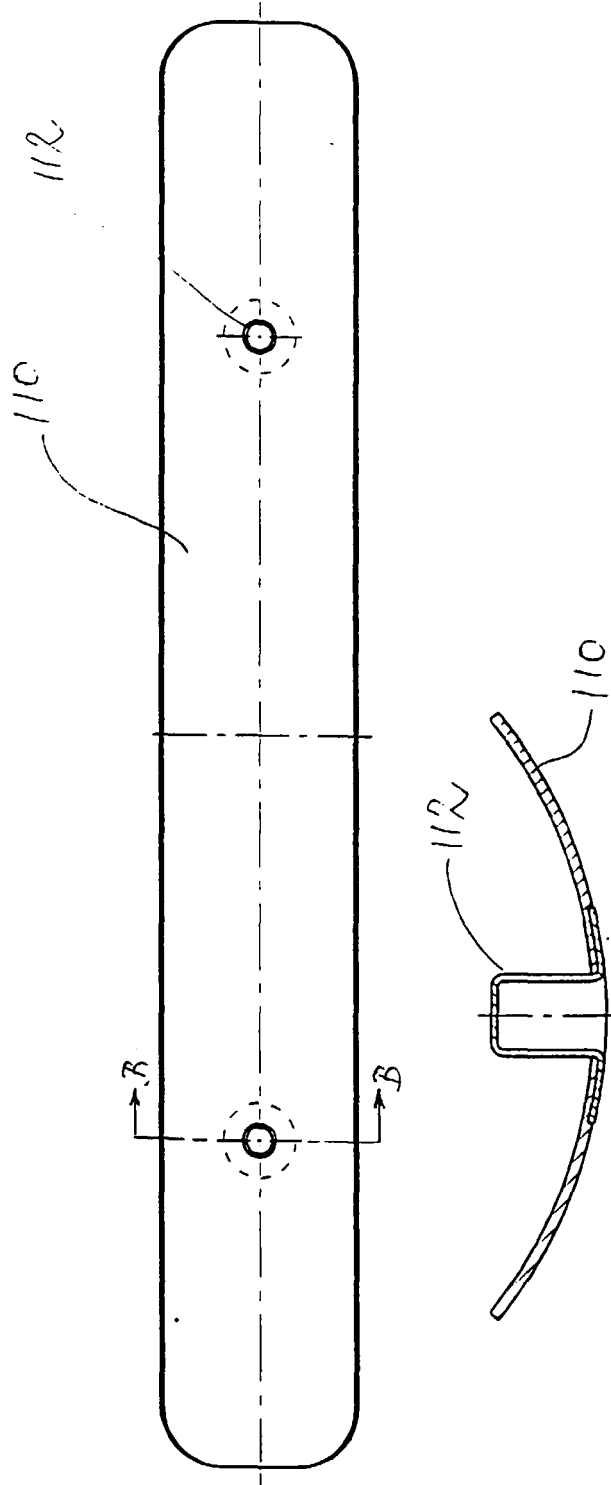


Fig. 5A

Fig. 5B

PRIOR ART (I)

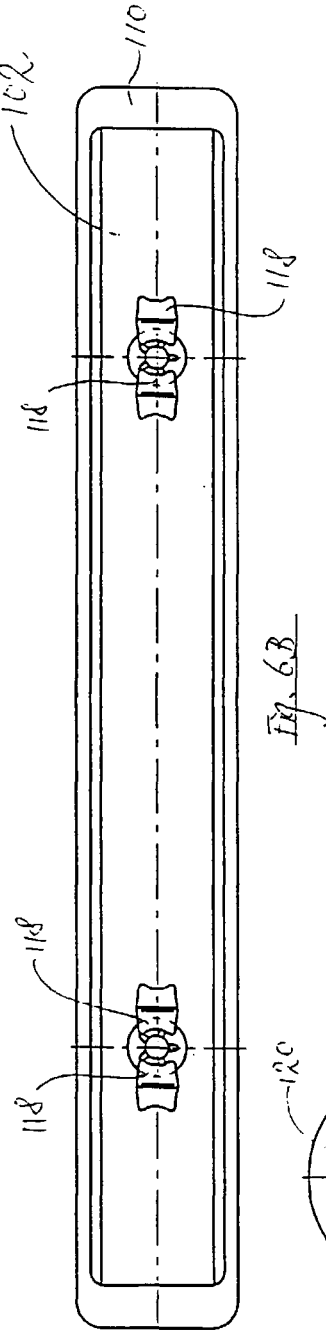
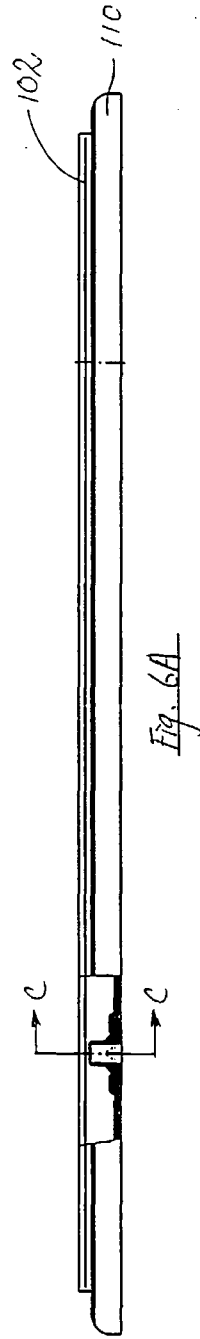
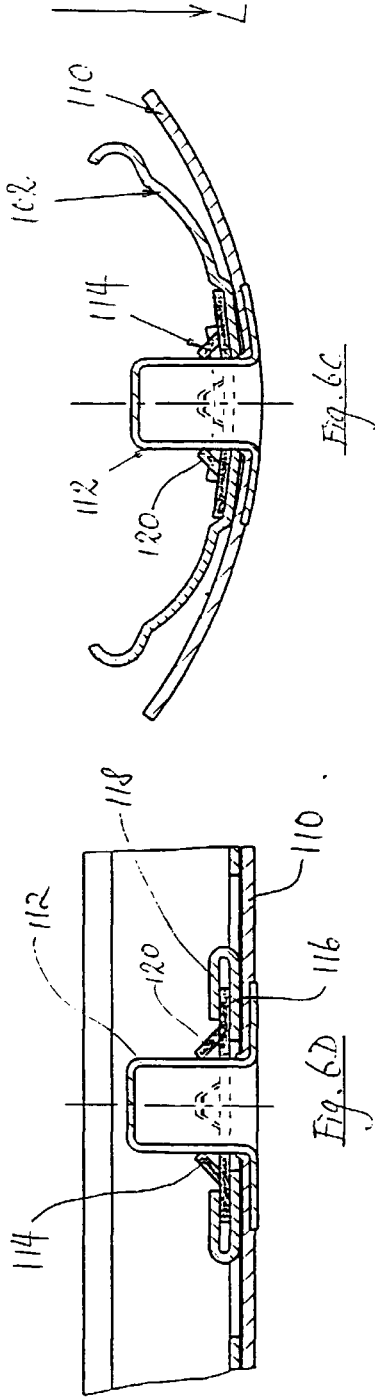


Fig. 6B

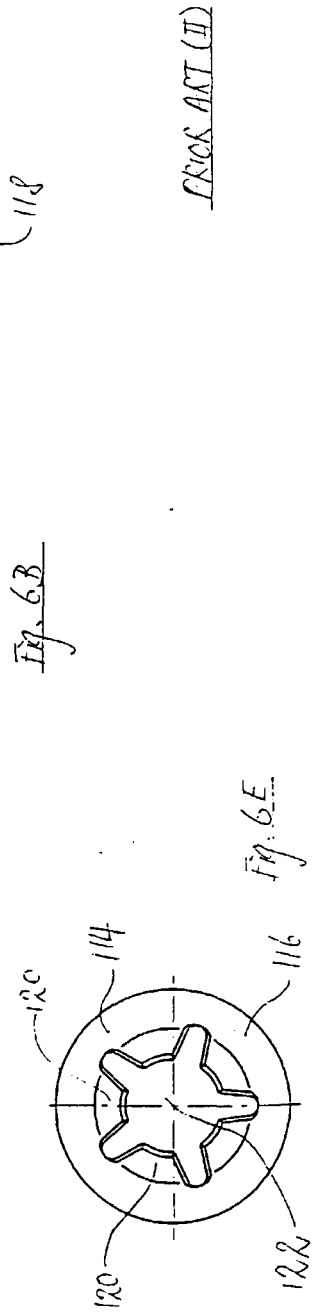
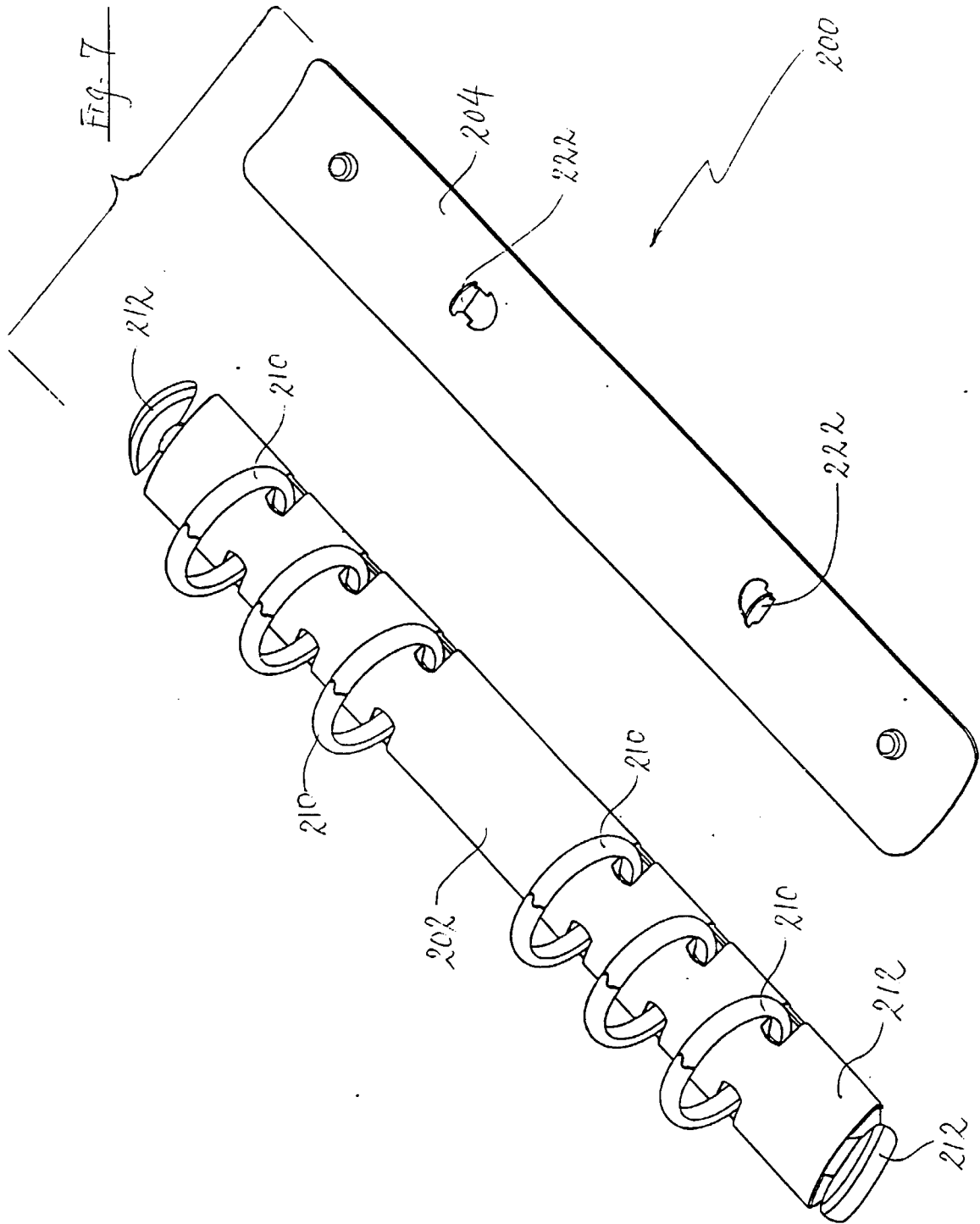
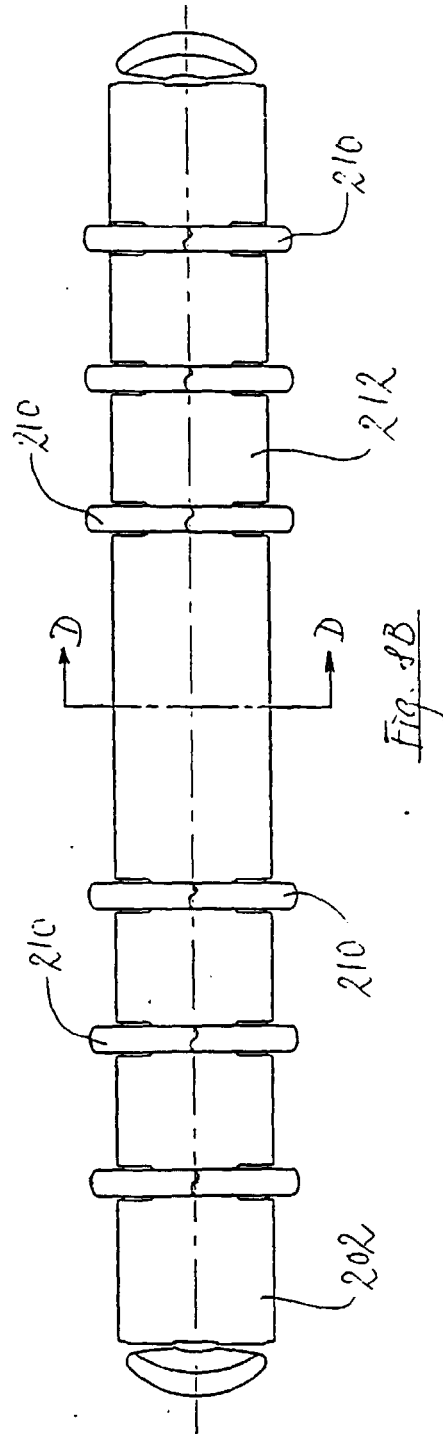
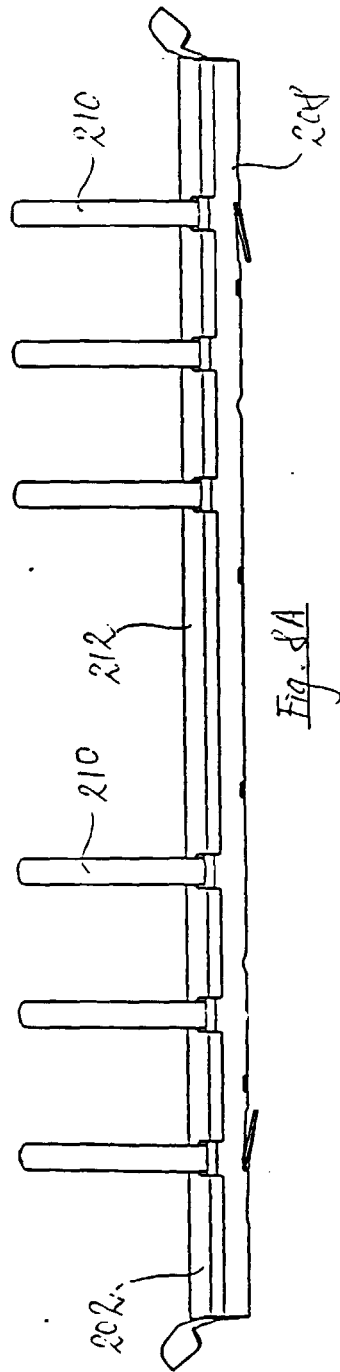
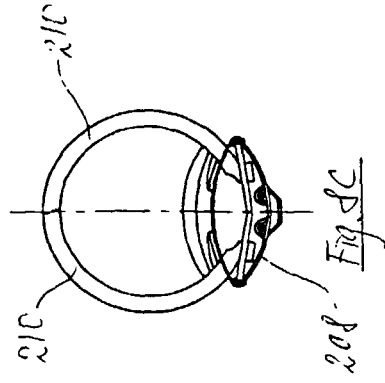
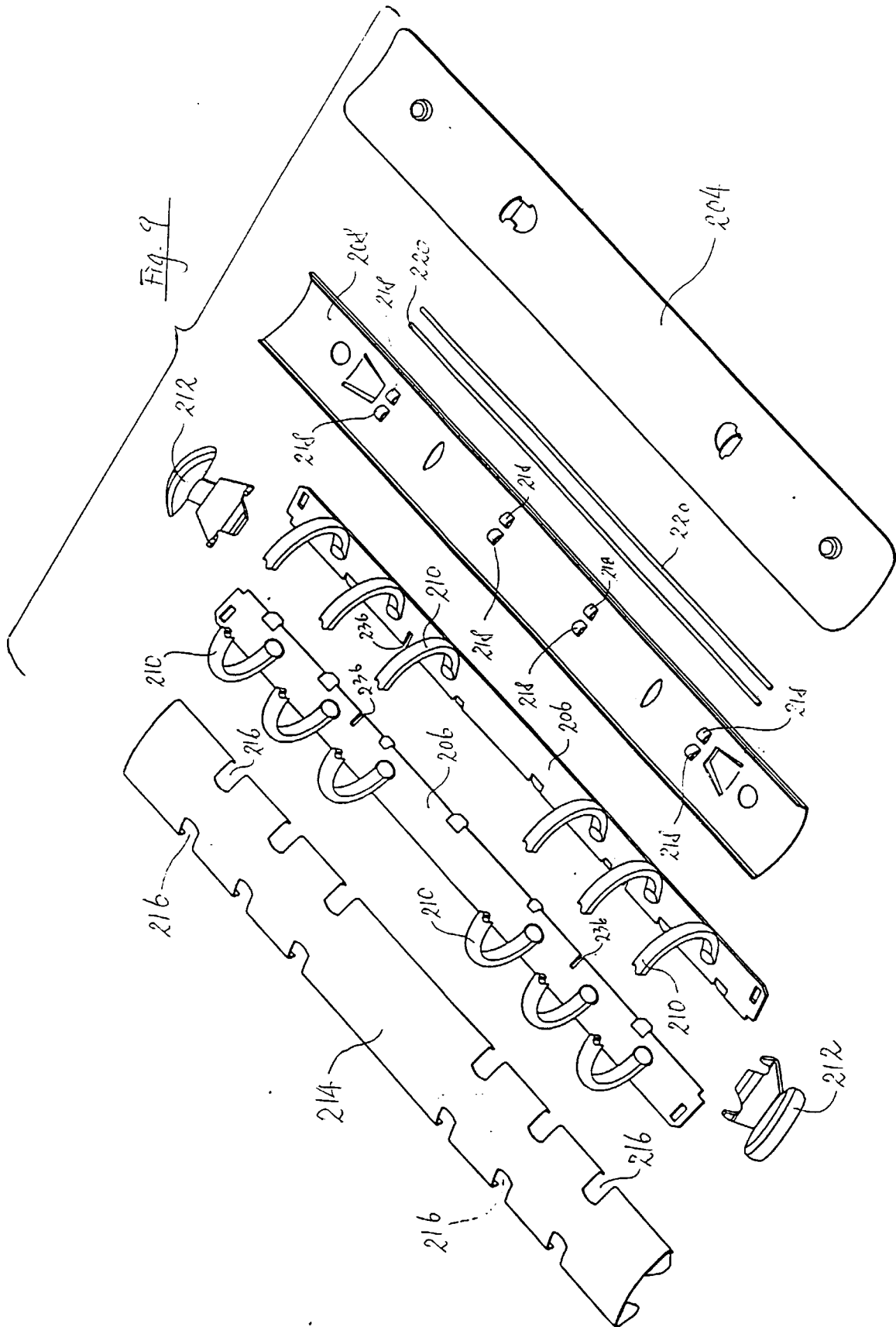


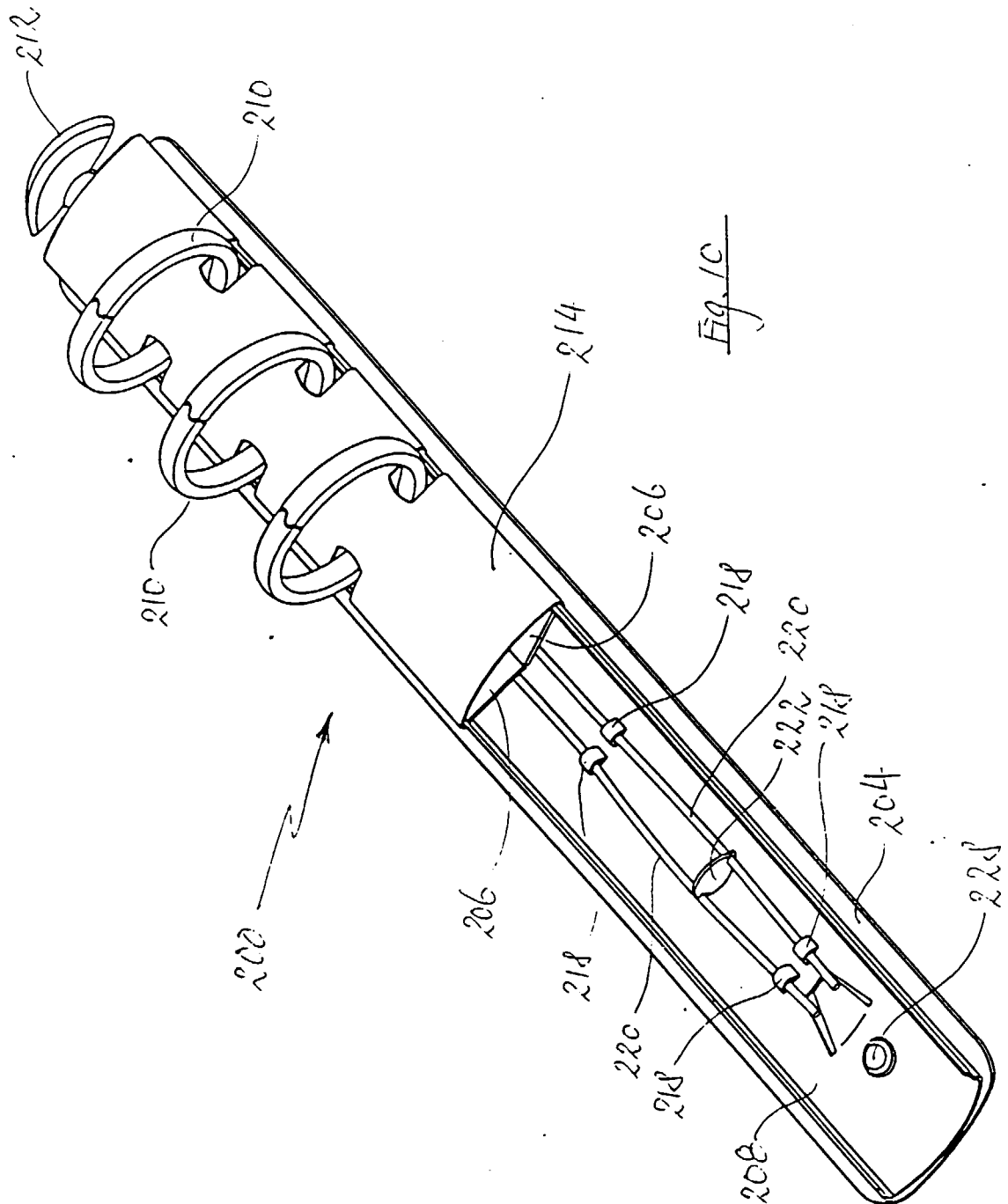
Fig. 6E

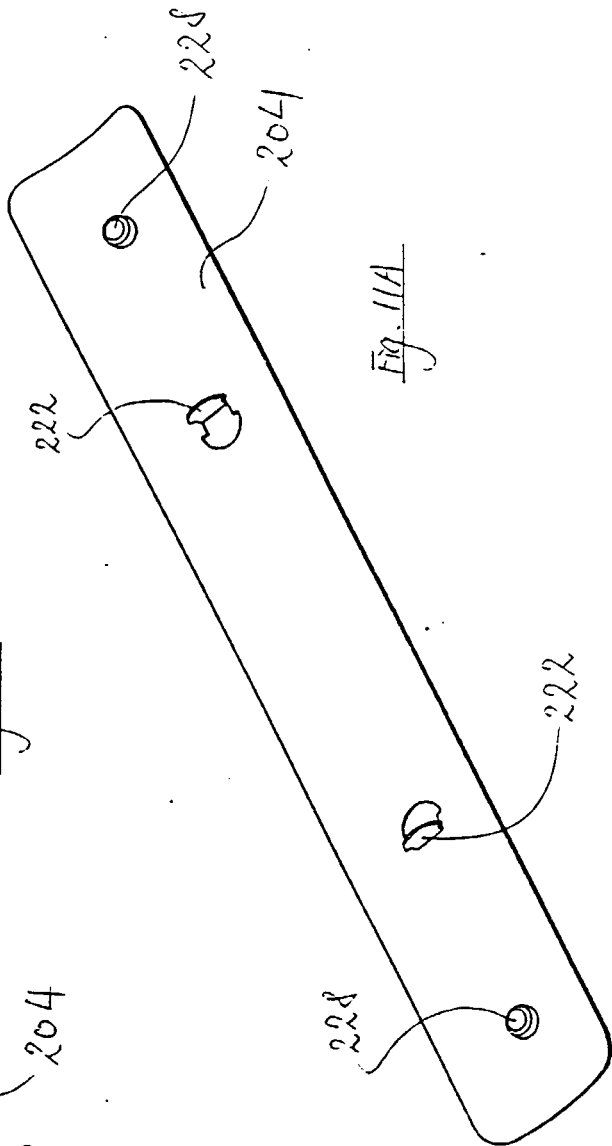
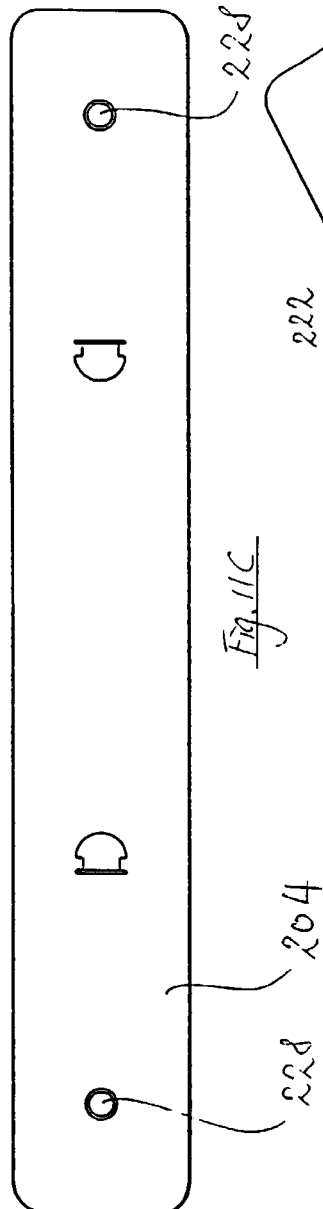
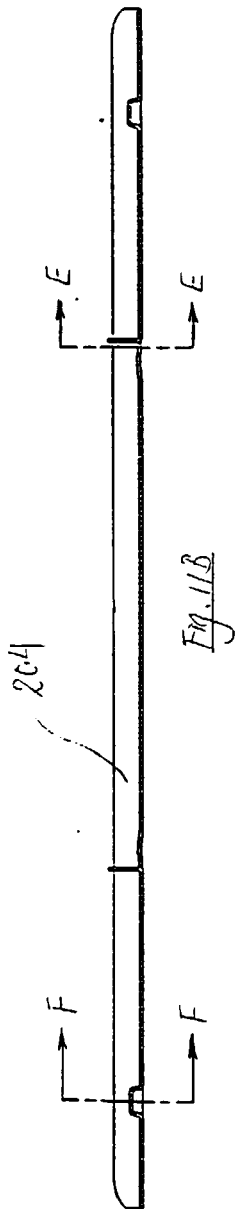
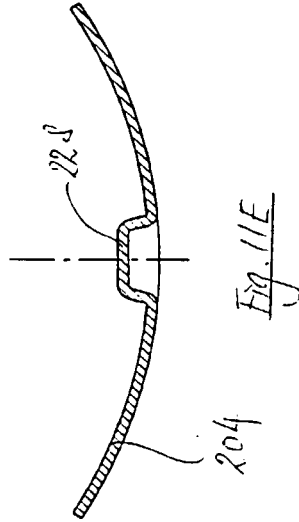
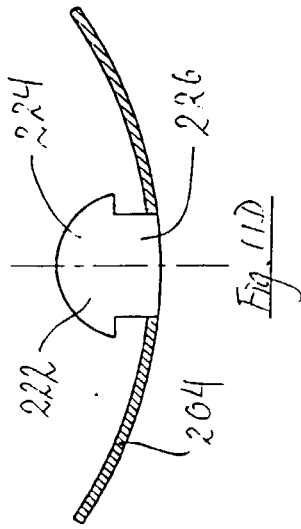
FIG. 6A (II)











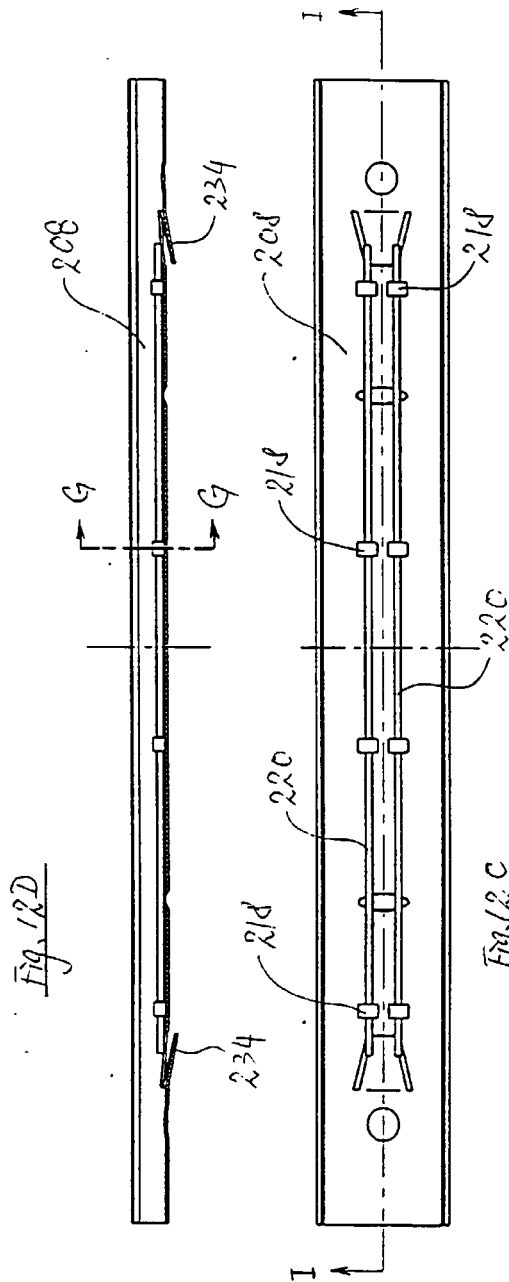
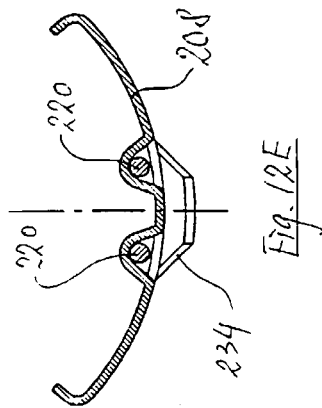


Fig. 12C

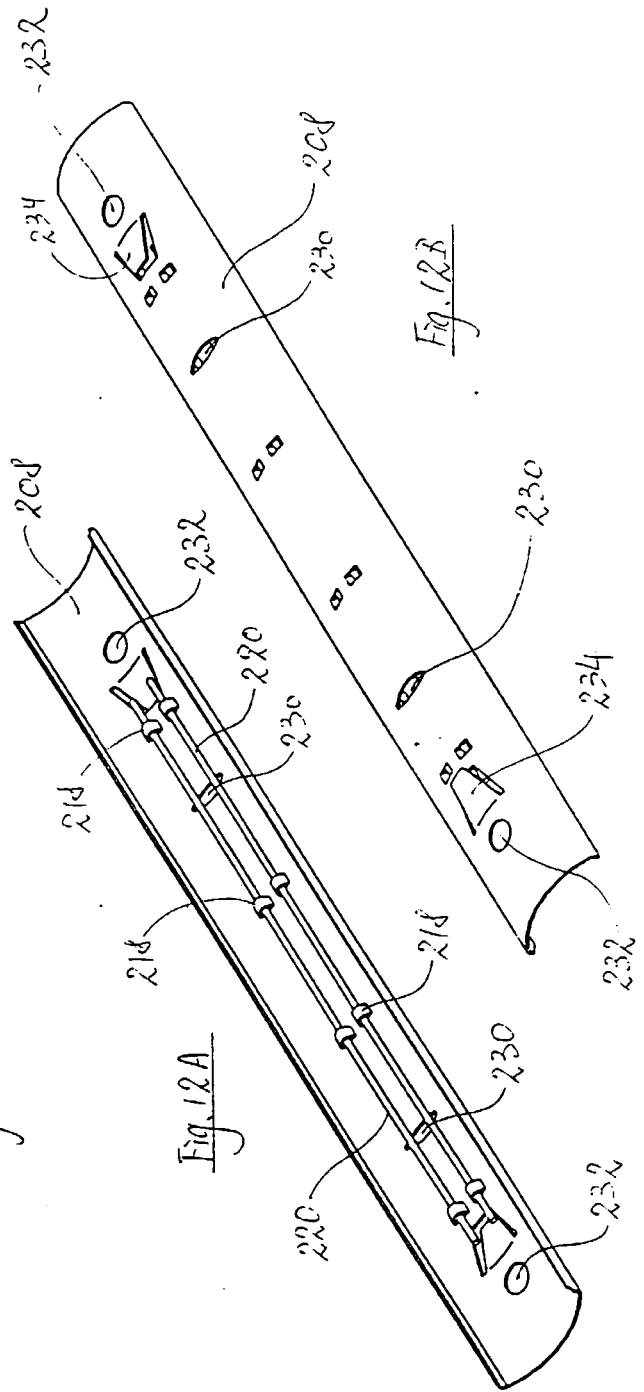
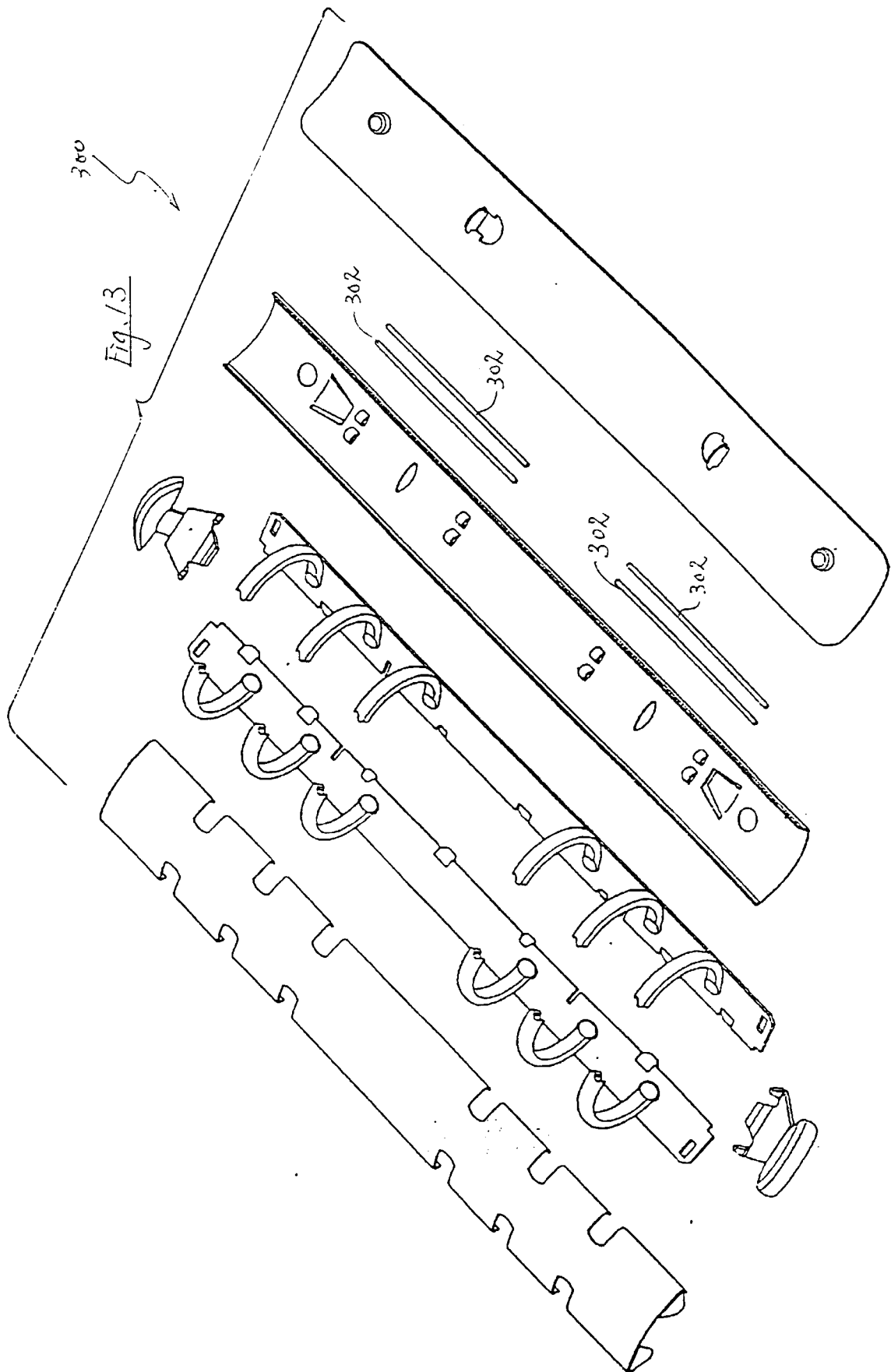


Fig. 12B



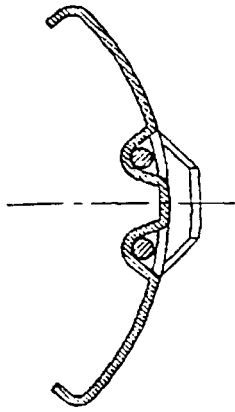


Fig. 14E

Fig. 14D

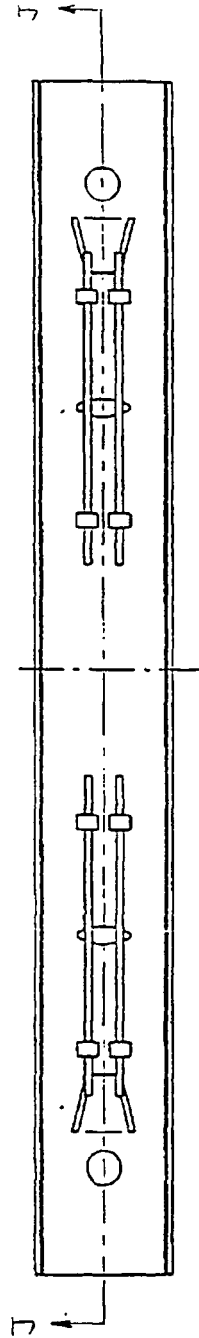
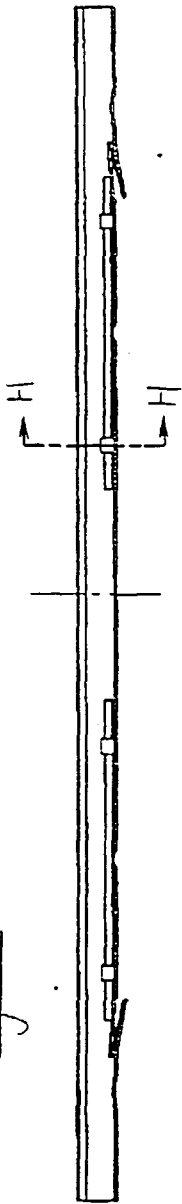


Fig. 14C

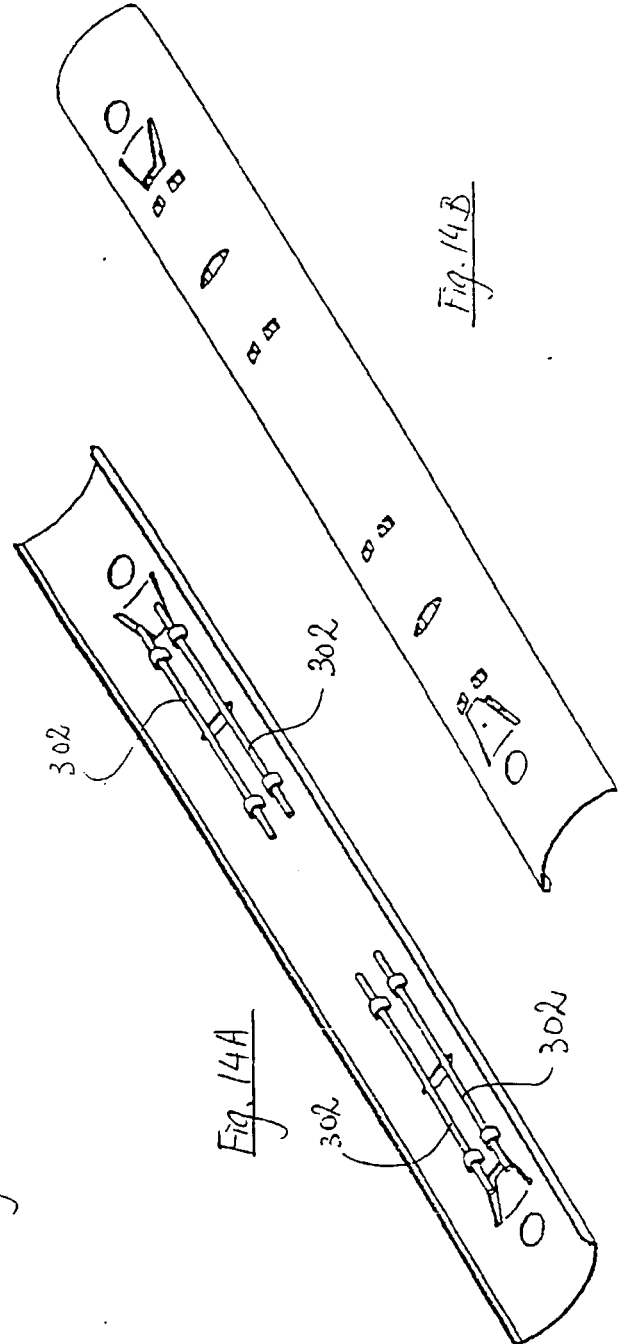


Fig. 14A

Fig. 14B

