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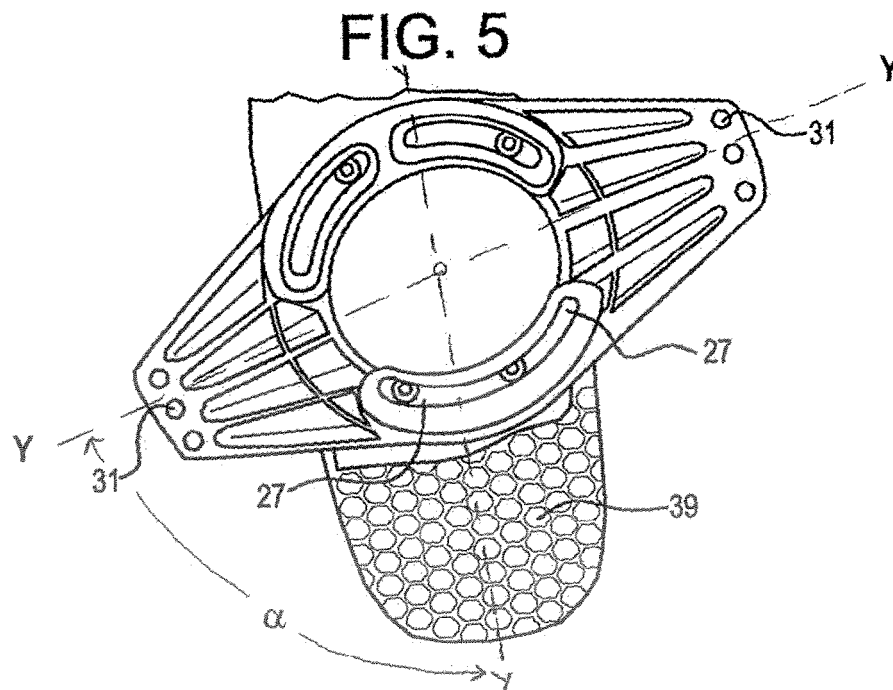
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(54) **Wakeboard binding plate assembly and method of use**

(57) A wakeboard binding plate assembly includes a binding plate and binding chassis that allows for a light weight and low cost attachment of a boot assembly to the wakeboard. The binding plate includes toothed segments on a side that are adapted to engage toothed segments in a bottom surface of the binding chassis of a boot assembly. The angular position of boot assembly with respect to the binding plate is determined, and the

binding plate is fitted to the binding chassis so that the angular position is attained, with the teeth of the plate and chassis engaged to maintain the desired angular orientation. The plate has slots (31) and the chassis has openings, and fasteners extend through the slots and into the openings to attach the plate to the chassis. The plate is equipped with ears that facilitate attachment to the wakeboard.



Description

[0001] This application claims priority under 35 USC 119(e) based on provisional patent application no. 60/693,792 filed on June 27, 2006, which is herein incorporated by reference in its entirety.

Field of the Invention

[0002] The present invention is directed to an improved wakeboard binding plate assembly, and particularly to a wakeboard binding plate assembly that facilitates easy adjustment of the alignment of the feet of a wakeboard user.

Background Art

[0003] In the prior art, various types of bindings are used for wakeboards. One desirable feature of these bindings is adjustability so that a user can orient the bindings in a particular direction. One type uses boot assemblies, which includes the various components necessary to retain a user's feet to the wakeboard. The boot assembly is mounted to a base plate or the like, with the base plate being movable. An example of this type of binding is in United States Patent No. 5,021,017 to Ott. However, the present day adjustable bindings are often complicated in design or are not easily adjusted.

[0004] While bindings are also employed for snowboards, these bindings are not suited for wakeboards, since the snowboard bindings are designed so that the boot is removable from the binding assembly. In contrast, the boot assembly of the wakeboard stays on the wakeboard, with the user removing his foot from the wakeboard boot.

[0005] As such, a need exists for improved adjustability for wakeboard bindings. The present invention responds to this need through an improved binding plate assembly that permits easy and quick adjustment of the orientation of the wakeboard binding.

[0006] One improved binding plate assembly is disclosed in United States Patent No. 6,945,837 to Crumrine et al., herein incorporated by reference in its entirety. In this patent, an improved plate assembly is disclosed that employs a disc and a ring. The disc is designed to attach to a wakeboard boot binding with the ring designed to attach to the wakeboard itself. The ring and disk have irregular surfaces designed to engage each other. The disk and ring can be engaged in a desired arrangement, and then the ring is secured to the wakeboard, thus locking the disk and boot binding in a desired angular attachment. Loosening of the ring once attached to the wakeboard allows the disk and boot binding to be rotated for binding angular adjustment. Figures 1 and 2 shows the binding plate assembly of United States Patent No. 6,945,837. Therein, the binding plate is designated by the reference numeral 10 and is seen attached to a wakeboard 1 and supporting a boot assembly 3. The boot as-

sembly 3 is exemplary and virtually any type of boot assembly can be used with the binding plate assembly of the invention. The ring is shown as 5 with the disk designated as 7. Teeth 9 on ring 5 are designed to engage teeth 11 on disk 7 to hold the disk 7 in place when the ring 5 is attached to the board 1. The ring has openings 13 to allow for attachment to the wakeboard 1 using fasteners (not shown), with openings 15 allowing the disk to be attached to a chassis of the boot assembly 3.

[0007] While the binding plate assembly of United States Patent No. 6,945,837 is advantageous in that it offers an easy and quick adjustment by merely loosening the ring to allow the disk to rotate to another angular orientation, such an on-the-fly adjustment is not necessarily needed for more experienced riders. The experienced riders generally know the desired angular orientation of their binding plate and do not need a quick adjustment feature, and the features of the plate assembly of United States Patent No. 6,945,837 often go unused by certain riders.

[0008] As such, a need exists for improved wakeboard bindings that cater to the more rider. The present invention responds to this need through an improved binding plate assembly that is simpler and lighter in weight than that of the prior art.

Summary of the invention

[0009] A first object of the invention is an improved wakeboard binding plate assembly.

[0010] Another object of the invention is a wakeboard binding using the inventive binding plate assembly.

[0011] A further object of the invention is a method of easily establishing the orientation of a wakeboard binding.

[0012] Other objects and advantages will become apparent when reviewing the description below.

[0013] In satisfaction of the foregoing objects and advantages, the invention is an improvement in a wakeboard binding that employs a boot assembly that is attached to a wakeboard through an intermediate component such as a binding plate. The invention comprises the combination of binding chassis and a binding plate, wherein the binding plate is adapted to attach to a wakeboard. The binding plate has at least one irregular surface with the binding chassis having at least one other irregular surface. The irregular surface of the binding plate is adapted to engage the irregular surface of the binding chassis to maintain them in a desired angular configuration. The binding plate includes means for attaching the plate to both the binding chassis and the wakeboard.

[0014] Preferably, the irregular surface of the binding chassis is a toothed ring or segments of a toothed ring with the irregular surface of the binding plate being similar in structure.

[0015] The means for attaching the binding plate to the binding chassis can include a plurality of openings in the binding chassis, a plurality of slots or other openings in

the binding plate, and fasteners designed to pass through the slots or openings in the binding plate and be secured to the openings in the binding chassis. The slots or openings in the plate are designed so that the openings in the binding chassis adapted to receive the fasteners are visible in spite of the binding plate being rotated with respect to the binding chassis.

[0016] While the irregular surface can be any type, if teeth are employed, it is preferred to have the teeth configured such that rotation of the binding plate by one tooth results in a known angular change in the angular position of the plate with respect to the binding chassis. This allows a user to know precisely the extent of angulation when moving the binding plate with respect to the binding chassis.

[0017] The invention also includes the method of securing a binding chassis to a wakeboard by the steps of providing the binding chassis and its irregular surface and the binding plate having its irregular surface on a face thereof. An angulation between the binding chassis and binding plate is determined and the irregular surfaces are mated based on the angulation. Once the angulation is determined, the binding plate is attached to the binding chassis, and the binding plate can then be attached to a wakeboard.

[0018] While the invention is an improvement in wakeboard bindings, the invention also includes the combination of the binding plate and binding chassis for use with a wakeboard as well as a wakeboard employing the novel binding plate assembly features.

Brief Description of the Drawings

[0019]

Figure 1 is a perspective view of a prior art binding plate assembly mounted on a wakeboard;
 Figure 2 is a perspective view of the ring and disc in an exploded configuration of the prior art binding plate assembly of Figure 1;
 Figure 3 is a perspective view of one embodiment of the binding plate assembly of the invention;
 Figure 4 is a bottom view of a binding chassis that includes an irregular surface;
 Figure 5 is a bottom view showing the plate and chassis attached together; and
 Figure 6 is a schematic sectional view showing the engagement of the binding plate and binding chassis.

Description of the Preferred Embodiments

[0020] The inventive binding plate for a wakeboard binding offers significant advantages over the prior art binding plates and adjustable mechanisms. A boot assembly using the inventive binding plate assembly is easily configured to a desired angular position with respect to the binding plate. A minimum number of components

are required, and the entire assembly is light weight, which is advantageous in wakeboarding.

[0021] Referring now to Figures 3-5, the inventive binding plate is designated by the reference numeral 20 and includes a center portion 21 and ears 23. The center portion 21 includes a center opening 25 and arcuate slots 27. The ears 23 have ribs 29 for strength purposes. The ears 23 also have openings 31 which facilitate attachment of the plate 20 to a wakeboard. Each ear 23 has a number of holes 31, one in each of the ears 23 adapted to receive a fastener to secure the plate to the wakeboard. The plurality of holes 31 allow for further adjustment of the plate 20 with respect to the wakeboard to increase the number of orientations available to the user of the wakeboard. While a number of holes are shown, each ear could have just one hole. These multiple holes also allow heel-to-toe adjustment of the wakeboard binding.

[0022] The center portion 21 of the plate 20 includes a pair of arcuate and irregular surfaced or toothed segments 33. As explained below, the teeth of the segments 33 assist in angular positioning of the boot assembly 3.

[0023] Figure 4 shows the boot binding chassis 35. The chassis has a toe portion 37, heel portion 39 and center portion 41. The center portion 41 includes a pair of toothed segments 43 and a set of threaded openings 45 (four in total). The toothed segments 43 can be secured to the binding chassis 35 in any known manner, mechanical attachment, molding, adhesives, combinations thereof, or the like.

[0024] In operation, a user already knows the desired angular stance for use, i.e., the boot assembly is particularly angled with respect to the binding plate attaching the boot to a wakeboard. Therefore, the plate 20 can be rotated to the desired angle with respect to the binding chassis-containing boot assembly 3, and the teeth 33 of the plate 20 can engage the teeth 43 in the binding chassis 35. With the plate 20 engaging the boot chassis, the slots 27 in the plate still expose the threaded openings 45 in the boot chassis 35, and fasteners (not shown) can be employed to secure the plate 20 to the binding chassis 35.

[0025] It should be understood that the slots 27 in the plate 20, threaded openings 45 in the binding chassis 35 and fasteners are but one means for attaching the plate 20 to the chassis 35. Other means could be used. For example, other shaped and/or different numbers of slots could be employed. Similarly, although threaded openings are shown to receive fasteners, other types of fasteners could be employed that would not require threading, e.g., press fit, adhesives, clamps, pins, etc.

[0026] The plate and chassis attached together are shown in Figures 5 and 6 and it can be seen that the centerline "X" of the boot chassis 35 and the centerline "Y" of the binding plate 20 are particularly angled, α with respect to each other. Depending on the user's preference, α can be altered by rotation of the plate with respect to the chassis. Once the plate 20 and chassis 35 are attached together, the openings 31 in the ears 23 of the

plate 20 are used to attach the plate 20 to the wakeboard using fasteners 47, and the bindings are ready for use by the user. Figure 6 also shows the binding chassis 5 and a portion of the binding upper 44 which is part of the boot assembly 3 for the user from a perspective defined by the axes X and Y. The binding upper is shown schematically, and can be any type of an upper structure which receives the feet of the wakeboard user. The engagement of the teeth of the chassis 35 and plate 20 are shown by reference numeral 46. Fasteners 49 that are employed to attach the plate 20 to the binding chassis 35 are also shown.

[0027] It should also be understood that while teeth are employed, virtually irregular surface that would allow plate 20 and chassis 35 to mesh or mate with each other to inhibit relative movement can be employed. Also, while arcuate toothed segments are used in the plate 20 and chassis 35, rings could be employed as well as other shaped segments that would allow the angular adjustment when attaching the plate 20 to the chassis 35.

[0028] The inventive binding assembly offers an improved binding plate design that involves only one piece, and is therefore less costly, and lighter in weight.

[0029] The inventive binding plate can be made from virtually any material, metal, polymers, composites, and combinations thereof. Polymers, such as nylon or the like are preferred for their strength and resistance to the effects of water. In addition, if the plate is metallic, the manufacturing methods, may involve stamping, machining, etc. Molding techniques such as compression, injection, etc. may be employed when using polymers as materials of construction.

[0030] It should be understood that the binding chassis is part of the boot assembly that is ultimately attached to the wakeboard. Boot assemblies have components that secure the foot of the user when riding the wakeboard, and include heel and toe pieces, one piece boots, overlays, underlays, laces, footbeds, bases and the like. The boot chassis is essentially the bottom component of the boot assembly that provides the surface of the irregular surface to engage the complementary irregular surface of the binding plate, and can take any of forms providing that it includes the bottom surface for mounting or inclusion of the irregular surface.

[0031] As such, an invention has been disclosed in terms of preferred embodiments thereof which fulfills each and every one of the objects of the present invention as set forth above and provides a new and improved wakeboard binding plate assembly, and its use in a wakeboard binding, and a method of use.

[0032] Of course, various changes, modifications and alterations from the teachings of the present invention may be contemplated by those skilled in the art without departing from the intended spirit and scope thereof. It is intended that the present invention only be limited by the terms of the appended claims.

Claims

1. A wakeboard binding plate assembly **characterized in that** it comprises:
 - a) a binding chassis (35) having at least one first irregular surface on a bottom surface thereof;
 - b) a binding plate (20) having at least one second irregular surface adapted to engage the first irregular surface and means for attaching the binding plate to a wakeboard; and
 - c) means for mounting the binding plate to the binding chassis in different angular orientations.
2. The assembly of claim 1, **characterized in that** the at least one first irregular surface comprises a toothed ring or a plurality of toothed segments (33) mounted to an underside of the chassis.
3. The assembly of claim 1 or 2, **characterized in that** the at least one second irregular surface further comprises a plurality of arcuate toothed segments (43) on an upper surface of the binding plate.
4. The assembly of claim 1, **characterized in that** the means for mounting the binding plate includes a plurality of first openings (45) in the binding chassis (35), a plurality of second openings (31) in the binding plate (20), and fasteners to extend through the second openings and into the first openings, the second openings configured so that the first openings remain visible through the second openings for receiving the fasteners regardless of angular orientation of the binding plate with respect to the binding chassis.
5. The assembly of claim 2 or 3, **characterized in that** each tooth represents a two degree change in angulation.
6. A method of securing a binding chassis to a binding plate in a given angular orientation for use with a wakeboard **characterized in that** it comprises:
 - a) providing a binding chassis with at least one first irregular surface on an underside thereof;
 - b) providing a binding plate with at least one second irregular surface on an upper side thereof;
 - c) selecting an angulation between the binding plate and binding chassis, and mating the at least one second irregular surface of the binding plate with the at least one first irregular surface of the binding chassis; and
 - d) securing the binding plate to the binding chassis with the selected angulation.
7. The method of claim 6, **characterized in that** it further comprises attaching the binding plate to a wakeboard.

8. The method of claim 6 or 7, **characterized in that** the at least one first and second irregular surfaces are one of a plurality of toothed segments or a toothed ring.

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9. In a wakeboard binding having a boot assembly with a binding chassis and a binding plate to secure the boot assembly to the wakeboard, the improvement comprising using the binding plate assembly of claim 1 to 5 to secure the boot assembly to the wakeboard.

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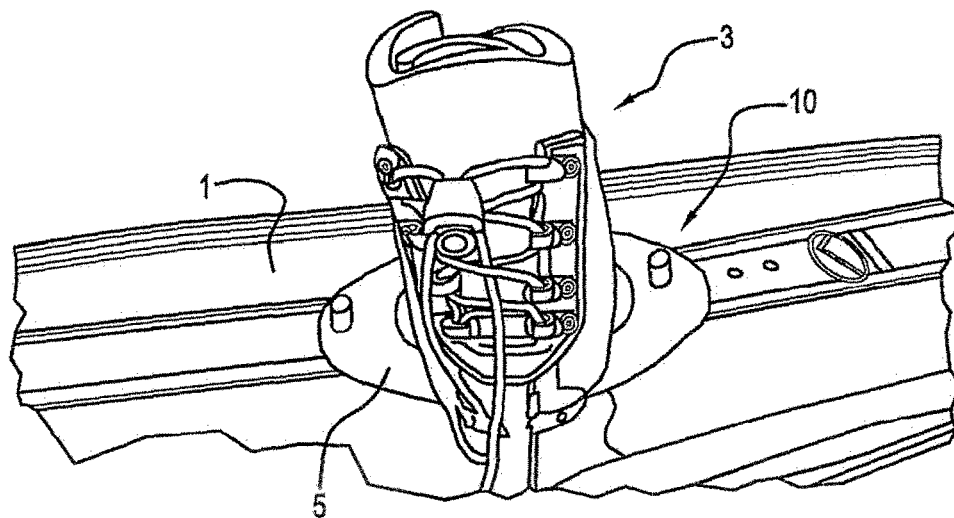
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FIG. 1



PRIOR ART

FIG. 2

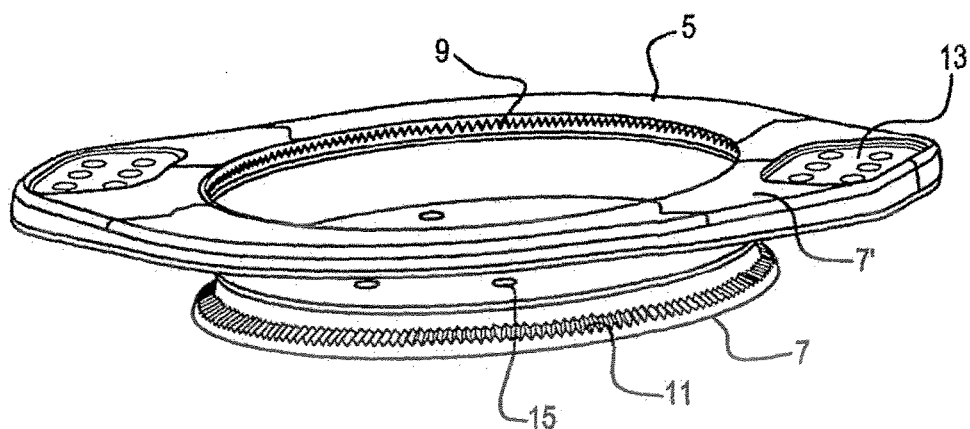


FIG. 3

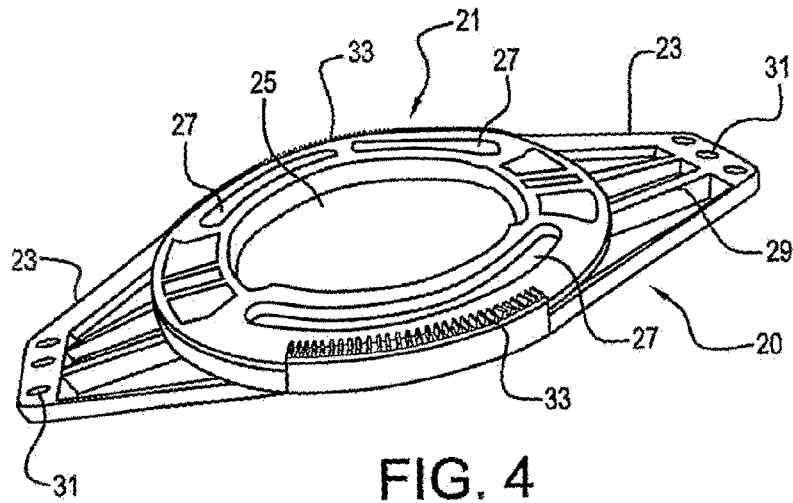


FIG. 4

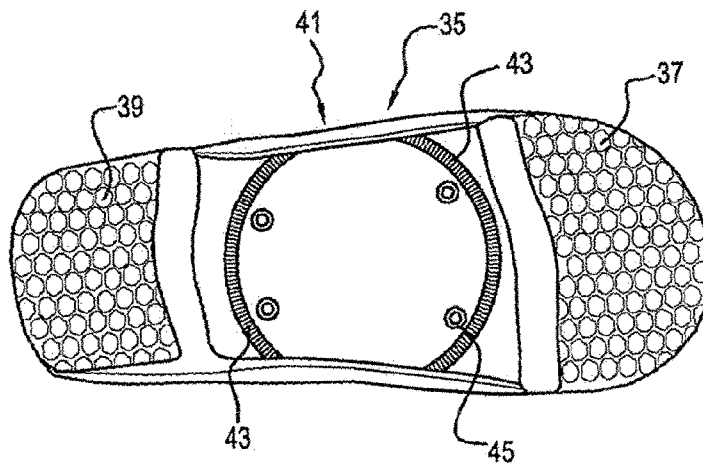
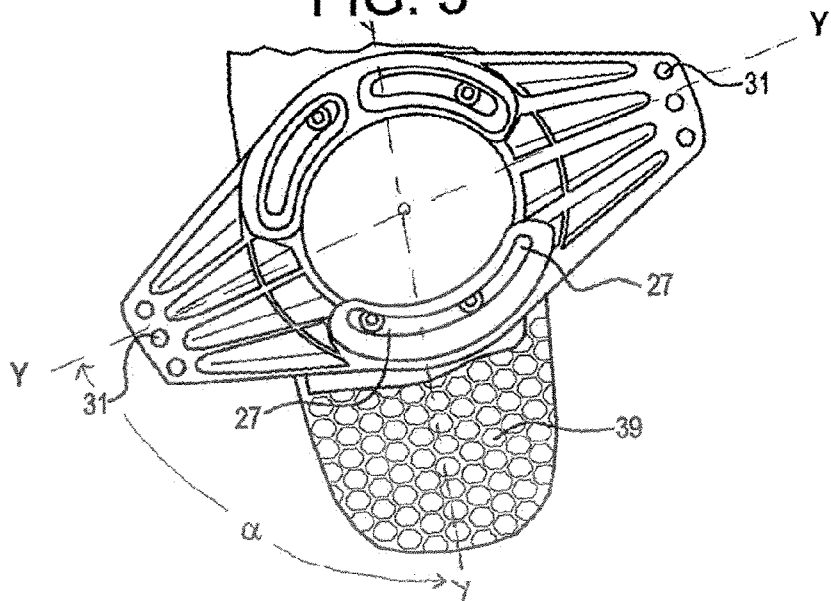


FIG. 5



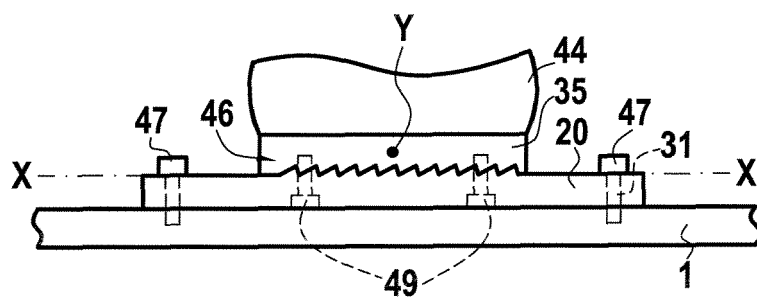


FIG.6



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 06 11 6171

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Place of search The Hague		Date of completion of the search 12 October 2006	Examiner van Rooij, Michael
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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