May 15, 1962 J. B. TWAITS, JR 3,034,596

QUICK RELEASE BUCKLE FOR HARNESS

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FIG. 3

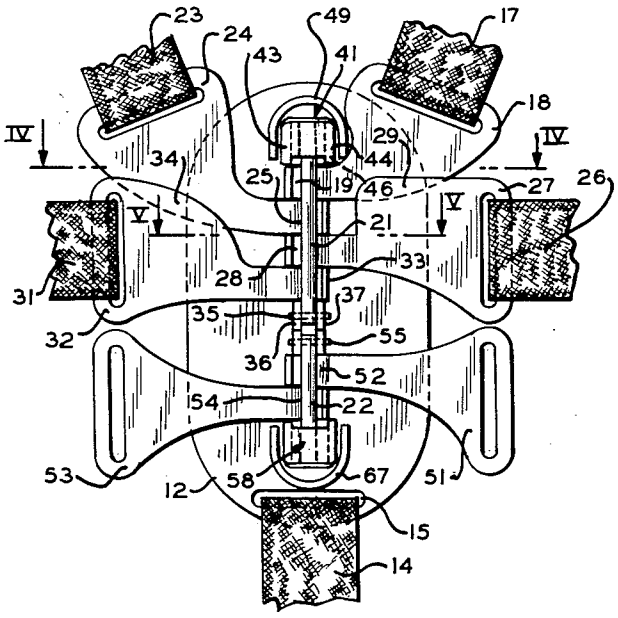
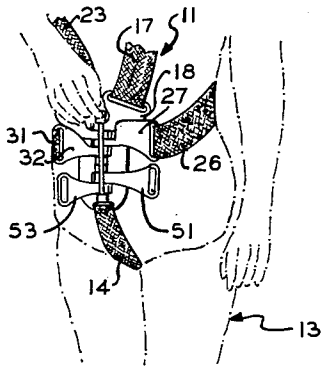


FIG. 1



VI FIG. 2

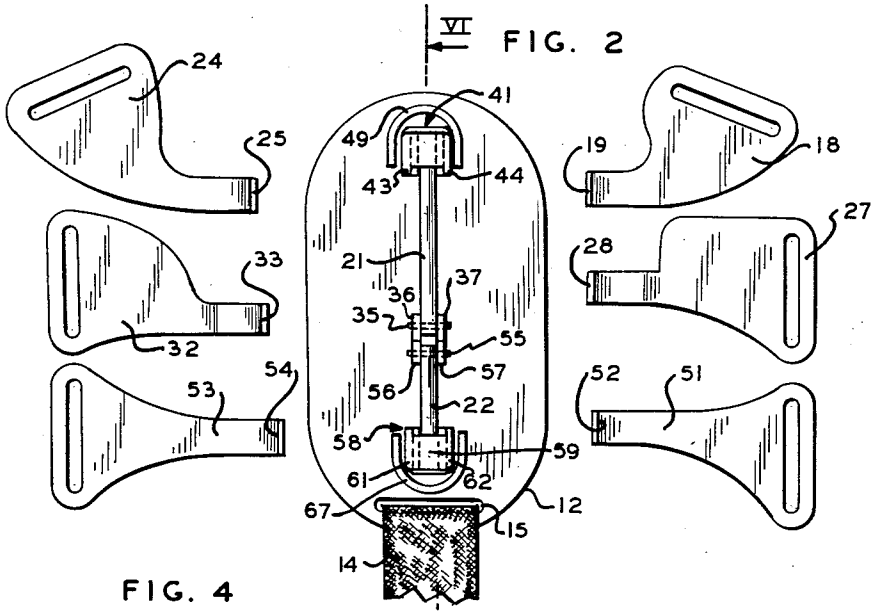


FIG. 4

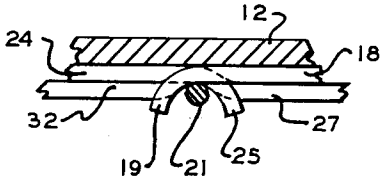


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FIG. 6

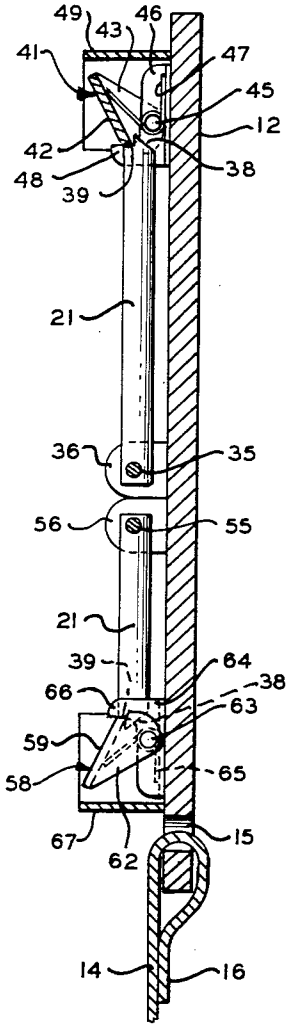


FIG. 7

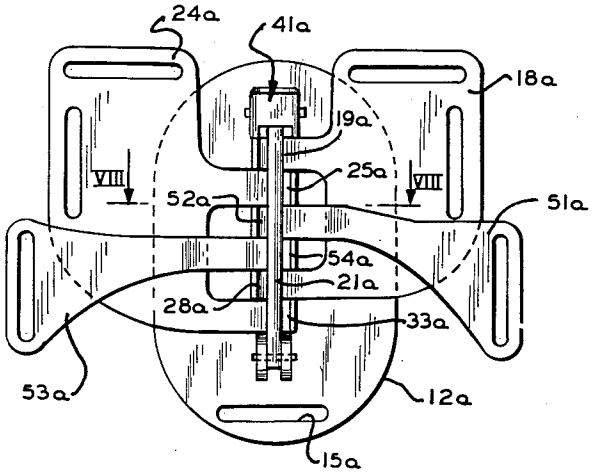


FIG. 5

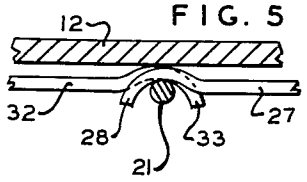


FIG. 8

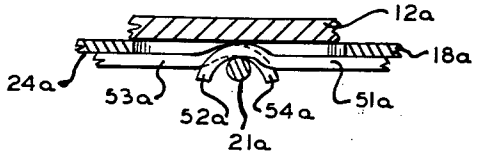
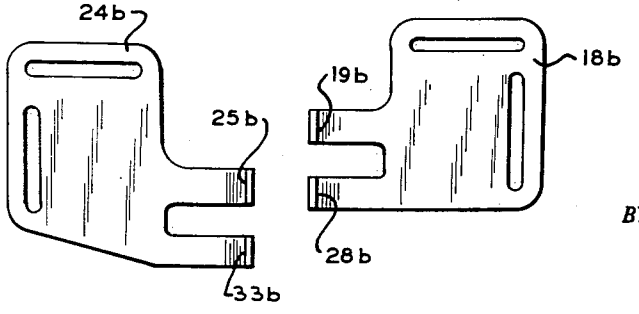


FIG. 9



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United States Patent Office 3,034,596 Patented May 15, 1962

3,034,596

QUICK RELEASE BUCKLE FOR HARNESS

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Filed June 3, 1960, Ser. No. 33,788
10 Claims. (Cl. 182—3)

This invention relates to harness suitable for use by skin divers and, more particularly, to such subject to quick release by the user so as to be free from the apparatus carried thereby.

In the art of diving and, more particularly, that type called "skin diving" in which self-contained underwater breathing apparatus, called "Scuba," is carried by the diver, it is important for the wearer to be able to quickly get free from the apparatus, as in case of emergency. In accordance with my invention, I have provided means for without complications quickly freeing the harness from the diver.

An object of my invention is to provide a harness suitable for use by skin divers, comprising straps or belts by means of which the self-contained underwater breathing apparatus is attached to the diver, which straps or belts are connected to a plate disposed in the front of the body of the user and from which plate said straps may be quickly released to free the user for uninhibited swimming or other activity.

Another object of my invention is to provide a quick release latching device for the shoulder and waist straps of such harness and another quick release latching device for use with the weight belt, if a weight is carried, and which is operable independently of the shoulder and waist strap release.

These and other objects and advantages will become apparent from the following detailed description when taken with the accompanying drawings. It will be understood that the drawings are for purposes of illustration and do not define the scope or limits of the invention, reference being had for the latter purpose to the appended claims.

In the drawings, wherein like reference characters denote like parts in the several views:

FIGURE 1 is a perspective view of a harness of the Scuba type worn by a diver and embodying my invention, the user's finger being illustrated in place for a pressure release of the harness.

FIGURE 2 is a fragmentary exploded view illustrating the front elements and the fastening means of the harness.

FIGURE 3 is a fragmentary elevational view, similar to FIGURE 2, but showing the front elements of said harness assembled and latched together.

FIGURE 4 is a fragmentary horizontal sectional view on the line IV—IV of FIGURE 3, in the direction of the arrows.

FIGURE 5 is a fragmentary horizontal sectional view on the line V—V of FIGURE 3, in the direction of the arrows.

FIGURE 6 is a vertical sectional view on the line VI—VI of FIGURE 2, in the direction of the arrows, except that the lower catch is shown in side elevation.

FIGURE 7 is a view corresponding generally to FIGURE 3, but showing a modification.

FIGURE 8 is a fragmentary horizontal sectional view on the line VIII—VIII of FIGURE 7, in the direction of the arrows.

FIGURE 9 is an exploded view of front elements of a modified form of harness.

Referring to the drawings in detail, and first considering the embodiment of my invention illustrated in FIGURES 1 to 6, inclusive, there is shown a harness of the Scuba type, generally designated **11**, only the front portions of which are illustrated. The back portions and the apparatus carried by the harness may be conventional. The front elements of the harness comprise a "back" plate **12**, called such because it is a backing for the other elements in the front of the harness, although it is worn at the front of the user, generally designated **13**, as viewed in FIGURE 1.

This back plate **12** has unreleasably connected thereto the front end portion of a crotch strap or belt **14**, as by passing through a lower slot or aperture **15** in said plate, and secured upon itself, as indicated at **16**, as by sewing or other suitable means. The other elements of the harness comprise a left shoulder strap or belt **17**, at the front portion of which is connected, as in a manner similar to the connection between the belt **14** and the plate **12**, a hook plate **18**, the free end portion of which is curved from the body portion or formed, as indicated at **19**, to connectingly hook under a latch pin **21**. The pin **21** may be the only latch pin on the plate, although in the embodiment of FIGURES 2 and 3 it is the upper of two latch pins, the other of which is designated **22**.

The right shoulder strap **23** is also similarly provided with a hook plate **24**, the free end portion of which is curved from the body portion or formed, as indicated at **25**, to lie below the hook portion **19** and connectingly hook under the pin **21**, like the portion **19** of the plate **18**. The left waist strap **26** is likewise similarly equipped with a hook plate **27**, the free end portion of which is curved from the body portion, as indicated at **28**, to lie below the hook portion **25** and connectingly hook under the pin **21**. This plate **27**, as shown in FIGURE 3, is desirably extensive enough to partially overlap plate **18**, as indicated at **29**, thereby bringing said plate forward an amount equivalent to the thickness of the plate **18** and necessitating a somewhat greater curvature from the plane of the body portion to provide the curved portion **28** which underlies the same pin **21** as the curved portion **19**.

In the same way, the right hand waist strap **31** is similarly provided with a hook plate **32**, the free end portion of which is curved, as indicated at **33**, to lie below the hook portion **28** and connectingly hook under the pin **21**. This plate **32** also is desirably extensive enough to partially overlap plate **24**, as indicated at **34**, thereby bringing it forward an amount equivalent to the thickness of the plate **24** and necessitating a somewhat greater curvature from the plane of the body portion to provide the curved portion **33**.

The latch **21** in the present embodiment is connected to the plate **12** by means of a pivot pin **35** extending through the lower end portion thereof and through laterally-spaced lugs or ears **36** and **37**, extending outwardly from said plate The free end of the pin **21** is desirably beveled, as indicated at **38**, and notched, as indicated at **39**. The notch is adapted to receive the lower edge portion of a catch **41**, as viewed in FIGURE 6. Said catch comprises a body **42** from which flanges or lugs **43**, **44**, extend at opposite side edges and are apertured to receive a pivot pin **45**. The pin **45** passes through lug portions **46** outstanding from the face of the plate **12**, and embraced between the flanges **43** and **44** of the catch **41**.

Surrounding this pin **45** is a helically coiled spring **47**, tails at the end portions of which respectively press on the plate **12** and the body **42** of the catch **41**, to hold said catch in the position illustrated in FIGURE. 6. Here its body portion **42** is stopped against further counterclockwise movement by engagement with the upper end portions **48** of the lug portions **46**, and also received in the notch **39** of the pin **21**. It also overlies the beveled portion **38** to hold said pin **21** in the position illustrated in FIGURE 6; that is, sufficiently close to the plate **12** to prevent the associated hook plates from being pulled

therefrom until release of said pin. When in such position, the hook plates, if interlocked therewith, are in the positions of FIGURE 3, that is, they may be then held locked with respect to said plate **12**, subject to release only upon swinging said catch from the position of FIGURE 6 in a clockwise direction, against the pressure of the spring **47**, to free the upper end of said pin **21**, and allow it to swing outwardly and away from the plate.

The foregoing is a description of the basic quick release harness of my invention and which may be used without any weight strap. However, it is also desirable to have the catch **41** protected from unintentional release. For such purpose I desirably have a curved catch guard flange **49** outstanding from the front face of the plate **12** to a place slightly above or outward of the position of the catch **41**, as viewed in FIGURE 6. Release of said catch is then possible only upon pushing inwardly thereon between the depending or end elements of said flange. An object engaging the flange **49**, but not extending beyond the upper or outer edge thereof will not serve to release the catch.

If it is desired to use a weight in connection with the harness **11**, then I make the back plate **12** somewhat longer than would otherwise be necessary and employ a second latch pin **22**, as shown most clearly in FIGURES 2 to 6, inclusive. With said second pin I connect the left hook plate **51** which is connected to a weight belt, not shown, in a manner similar to the connection of the other hook plates to their respective belts. The free end portion of said plate **51** is curved from the body portion, or formed, as indicated at **52** to hook under the pin **22**. The right weight strap, not shown, is also similarly provided with a hook plate **53**, the free end portion of which is curved from the body portion, or formed, as indicated at **54** to lie below the hook portion **52** and connectingly hook under the pin **22**, like the portion **52** of the plate **51**.

The latch **22**, in the present embodiment, is connected to the plate **12** by means of a pivot pin **55** extending thru the upper end portion thereof and through laterally spaced lugs or ears **56**, **57**, extending outwardly from said plate. The free end of the pin **22** is desirably beveled and notched like the pin **21**. The notch is adapted to receive the upper edge portion of a catch **58** as viewed in FIGURE 6. Said catch comprises a body **59** from which flanges or lugs **61**, **62**, extend at opposite side edges and are apertured to receive a pivot pin **63**. The pin **63** passes thru lug portions **64** outstanding from the face of plate **12** and embraced between the flanges **61** and **62** of the catch **58**.

Surrounding the pin **63** is a helically coiled spring **65**, tails at the end portions of which respectively press on the plate **12** and the body **59** of the catch **58** to hold said catch in the position illustrated in FIGURE 6. Here its body portion **59** is stopped against further clockwise movement by engagement with the upper end portions **66** of the lug portions **64** and also received in the notch of the pin **22**. The catch body portion **59** also overlies the beveled pin portion to hold said pin **22**, as illustrated in FIGURE 6, that is sufficiently close to the plate **12** to prevent the associated hook plates from being pulled therefrom until release of said pin. When in such position, the hook plates **51** and **53**, if interlocked therewith, are in the positions of FIGURE 3. That is, said hook plates may be then held locked with respect to the plate **12**, subject to release only upon swinging said catch **58** from the position of FIGURE 6 in a counter clockwise direction against the pressure of the spring **65** to free the lower end portion of said pin **21** and allow said pin to swing outwardly and away from the plate.

It is also desirable, as in connection with the catch **41**, to have the catch **58** protected from unintentional release. For such purpose, I desirably have a curved catch guard flange **67** outstanding from the front face of the plate **12** to a plane slightly above or outside of the position of the catch **58**, as viewed in FIGURE 6. Release of said catch is then possible only upon pushing inwardly thereon between the upstanding or end elements of said flange. An object engaging the flange **67**, but not extending beyond the upper or outer edge thereof will not serve to release said catch **58**.

Referring now to the embodiment of my invention as illustrated in FIGURES 7 and 8, a construction is there shown which is similar to that of FIGURES 1 to 6, inclusive, except that only one pin **21***a* serves for holding all of the hook plates, and the hooks of the shoulder and waist straps extend at each side from a single plate. As in the embodiment preceding, the back plate, **12***a* in this instance, has unreleasably connected thereto the front end portion of a crotch strap or belt, not shown, as by passing thru the lower slot or aperture **15***a* in said plate, and secured upon itself as in the preceding embodiment. The other elements of the harness comprise a left shoulder strap and a left waist strap, not shown, connected respectively as through the upper and lower slots illustrated therein to a left hook plate **18***a*. In the present instance, however, said hook plate has two free end portions which are curved from the body portion, or formed as indicated at **19***a* and **28***a*, to connectingly hook under the latch pin **21***a*.

In a similar way, the right shoulder strap, not shown, and the right waist strap, not shown, are connected to a single hook plate **24***a*, as by having the end portions pass thru the respective upper and lower slots shown in said plate. In the present instance the right hook plate **24***a* has two free end portions which are curved from the body portion, or formed, as indicated at **25***a* and **33***a*, to lie under the hook portions **19***a* and **28***a*, respectively, and connectingly hook under the pin **21***a*, like the portions **19***a* and **28***a* of the plate **18***a*.

If a weight is employed, a weight strap, not shown, has at its front ends a left hook plate **51***a* and a right hook plate **53***a* having, respectively, portions **52***a* and **54***a* formed to lie one under the other between the hook portions **25***a* and **28***a*, and connecting hook under the pin **21***a*, like the portions of the hook plates **18***a* and **24***a* previously described. The plate portion of the hook plate **51***a* overlaps the hook plate **18***a* and the plate portion of the hook plate **53***a* overlaps the hook plate **24***a*, as illustrated. Except as specifically described in connection with the present embodiment, the same may correspond with the first embodiment.

Referring now to the embodiment of my invention as illustrated in FIGURE 9, a construction of the double hook plates **18***b* and **24***b* is illustrated which is similar to that of the hook plates **18***a* and **24***a* of FIGURES 7 and 8, except that in this instance there is contemplated no weight. Thus a single pin, like the pin **21***a* only shorter, may be employed and the respective curved portions **19***b* and **28***b* on the plate **18***b*, and **25***b* and **33***b* of the plate **24***b* may be closer together so as to merely intermesh and lie below corresponding portions of one another, rather than allow a space therebetween for the reception of curved portions of hook plates of a weight belt. Except as specifically described in connection with the present embodiment, the same may correspond with FIGURES 7 and 8.

From the foregoing disclosure, it will be seen that I have provided a harness for skin diving or the like, which may be quickly released to avoid impeding the diver in case of emergency. Inasmuch as this harness may be used in fresh or salt water, the parts are sufficiently large for the necessary strength and desirably constructed of metal such as stainless steel, which is not materially corroded in such water. The springs for actuating the catches are formed of such metal and of such strength that, while the catches are readily releasable upon pressing a finger thereagainst, they are not subject to unintentional release, as might occur if they were too weak

and subject during swimming to movement upon the mere flow of water thereagainst.

The beveling of the latch pin, or pins, may be such, and its or their relationship with the edge of the catch body associated therewith, that after the assembly of the hook plates is made, the latching of each pin may be effected by a mere pressure thereon until the beveled portion pushes its catch aside and, at the end of the bevel, the catch snaps into the notch thereabove and holds the pin in locked position.

The assembly of the parts, in the embodiment of FIGURES 1 to 6, inclusive, is desirably from the top down. That is, the plate **18** is first placed in position, then the plate **24**, then the plate **27**, then the plate **32** and, if used, then the plate **51** and then the plate **53**. In the embodiment of FIGURES 7 and 8, the plate **18***a* is desirably first applied, then the plate **24***a*, then the plate **51***a* and then the plate **53***a*, and the assembly latched in place by closing the latch pin **21***a* thereover and latching it in position under the catch **41***a*.

Having now described the invention in detail in accordance with the requirements of the Patent Statutes, those skilled in this art will have no difficulty in making changes and modifications in the individual parts or their relative assembly in order to meet specific requirements or conditions. Such changes and modifications may be made without departing from the scope and spirit of the invention, as set forth in the following claims.

I claim:

1. A quick release buckle for harness provided with shoulder and waist straps having hooks at their front ends, suitable for use by skin divers, comprising a back plate to which the front end portion of a crotch strap is connected and from which other parts of the harness may radiate, a latch pin, means pivotally connecting one end portion of said pin so that it is swingable toward and away from the front face of said plate, a catch, means pivotally mounting the catch on the front face of said plate in position to hold the free end of said pin when placed so near said plate as to underlie said catch, a spring to urge said catch to pin-holding position, said pin being adapted to overlie the hooks on the front ends of the shoulder and waist straps of said harness and be locked in place when the free end of said pin underlies and is engaged by said catch, but subject to quick release upon a mere slight pressure, as of a finger, upon said catch to overcome the force of the spring, move it to release position, and allow the pin to swing out away from said plate and release the hooks.

2. A quick release buckle for harness provided with shoulder and waist straps having hooks at their front ends, as recited in claim 1, wherein said plate is provided with an outstanding flange curving around the catch so as to guard it against inadvertent release.

3. A quick release buckle for harness provided with shoulder and waist straps having hooks at their front ends, as recited in claim 1, wherein the plate is provided with an aperture positioned below the latch and through which the crotch strap passes for connection thereto.

4. A quick release buckle for harness provided with shoulder and waist straps having hooks at their front ends, as recited in claim 1, wherein the hooks are in the form of two plates, a right hand plate from which two curved portions extend to connectingly underlie the pin, and a left hand plate from which two curved portions extend to alternate with the curved portions of the right hand plate and connectingly underlie said pin.

5. A quick release buckle for harness provided with shoulder and waist straps having hooks at their front ends, as recited in claim 1, wherein the hooks for the shoulder and waist straps extend respectively from a single hook plate at the right and a single hook plate at the left, and there are additional hooks on the front ends of weight straps of said harness, adapted to connectingly underlie said pin and be locked in place when the free end of said pin underlies and is engaged by said catch, which hooks extend from their own plates independently of the other hook plates.

6. A quick release buckle for harness provided with shoulder and waist straps having hooks at their front ends, as recited in claim 1, wherein the hooks are in the form of four plates, each with a curved end portion for hooking under a single latch pin when the latter is in latched position and releasable from said pin and from each other upon release of the catch.

7. A quick release buckle for harness provided with shoulder and waist straps having hooks at their front ends, as recited in claim 1, wherein there is a second latch pin, means pivotally connecting one end portion of said second latch pin so that it is swingable toward and away from the front face of said plate, a second catch, means pivotally mounting said second catch on the front face of said plate in position to hold the free end of said second pin when placed so near said plate as to underlie said catch, a spring to urge said second catch to pin-holding position, wherein the harness has additional hooks on the front ends of weight straps, adapted to connectingly underlie said second pin and be locked in place when the free end of said second pin underlies and is engaged by said second catch, but subject to quick release, independent of the release of the other hooks, upon a mere slight pressure, as of a finger upon said second catch to overcome the force of its spring, move it to release position, and allow said second pin to swing out away from said plate and release said additional hooks.

8. A quick release buckle for harness provided with shoulder and waist straps having hooks at their front ends, as recited in claim 6, wherein the waist strap plates overlap the respective shoulder strap plates at the corresponding sides of the harness, and their pin-underlying portions are curved to a correspondingly greater extent from the planes of the body portions of the plates.

9. A quick release buckle for harness provided with shoulder and waist straps having hooks at their front ends, as recited in claim 8, wherein said first and second pins are pivoted at their adjacent end portions and the catches are respectively above the upper pin and below the lower pin.

10. A quick release buckle for harness provided with shoulder and waist straps having hooks at their front ends, as recited in claim 9, wherein there are in the aggregate six hooks, two for the shoulder straps, two for the waist straps and two for the weight straps.

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