

- [54] **SPRING LATCHING SAFETY BELT
PUSH TYPE**
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[73] Assignee: **Irvin Industries Inc.**, Greenwich,
Conn.
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Related U.S. Application Data

- [63] Continuation of Ser. No. 762,943, Sept. 26,
1968, abandoned.
[52] U.S. Cl. 24/230 A
[51] Int. Cl. A44b 11/26
[58] Field of Search.....24/230 A, 230 AZ; 26/230 A,
26/52, 52 R, 52 AV

References Cited

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[57] ABSTRACT

A safety belt buckle construction in which a latching dog and biasing spring are integrally connected in such relation within a casing as to enable an operating means to simultaneously flex the spring and move the the dog into operative latching position. The rigidly and integrally connected biasing means and latching dog provide a mechanical device capable of withstanding large belt forces. The movable mounting construction of the latch is such as to provide added strength to the latching dog.

6 Claims, 7 Drawing Figures

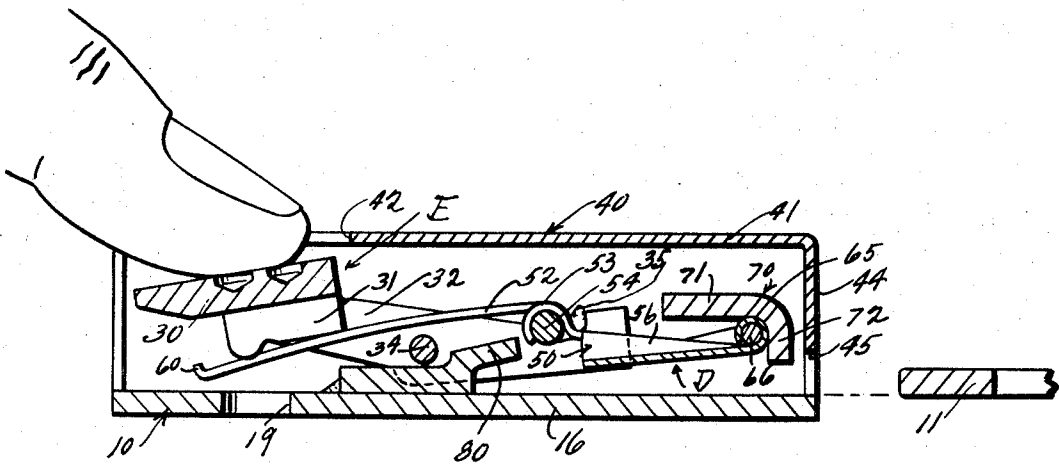


Fig. 1

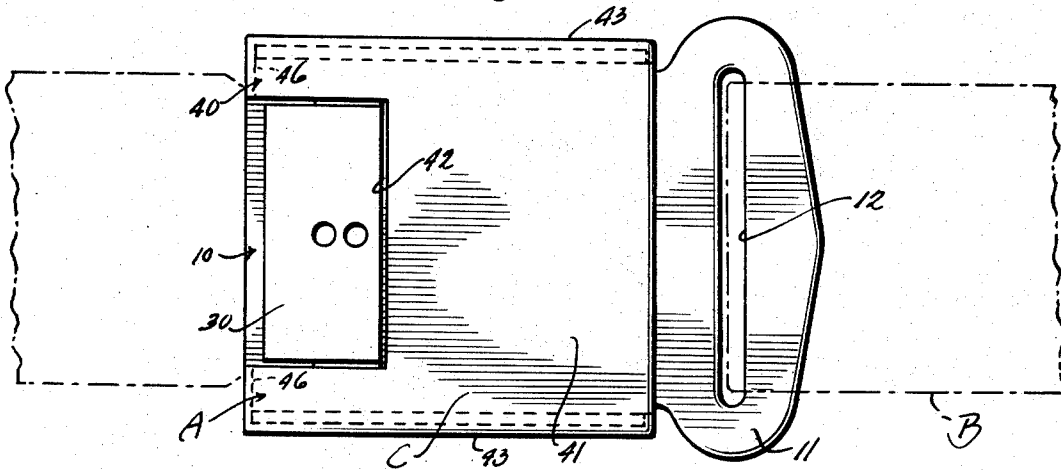
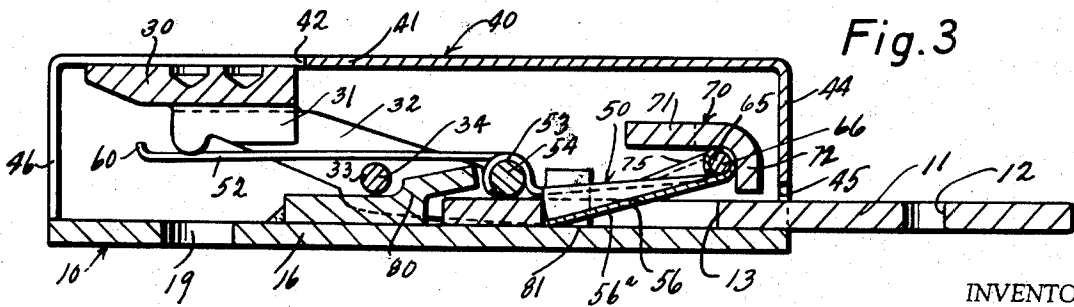
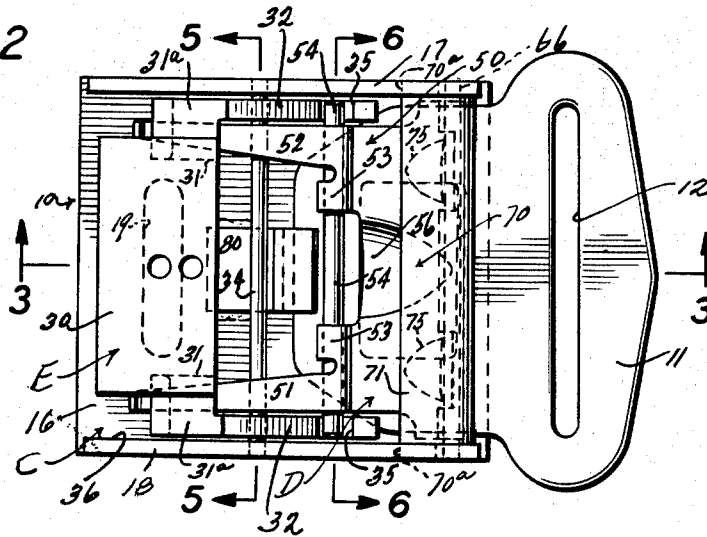


Fig. 2



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Fig. 4

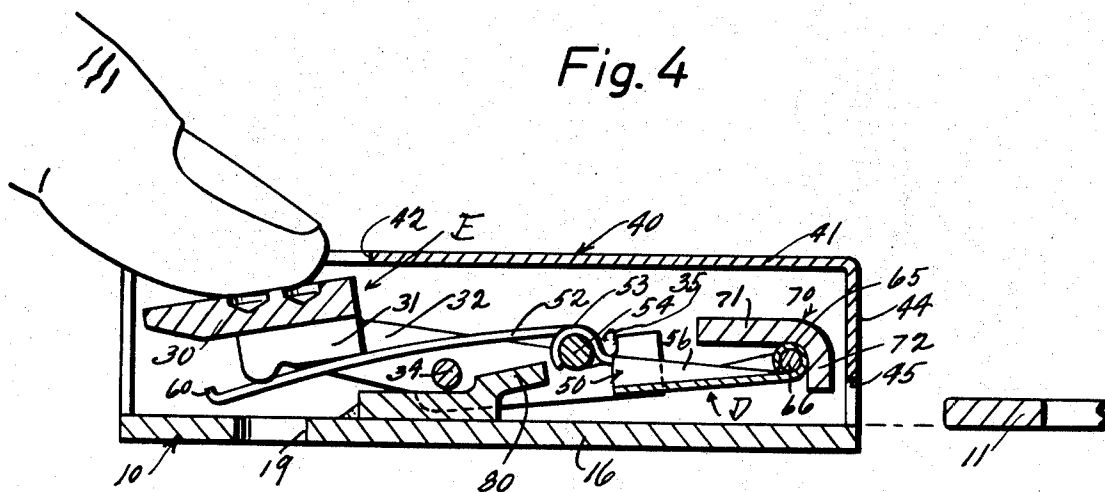


Fig. 5

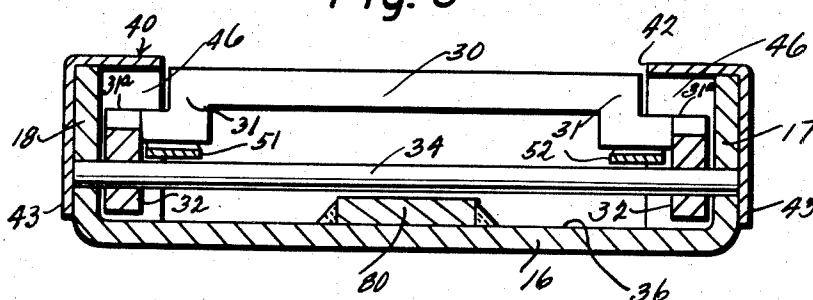
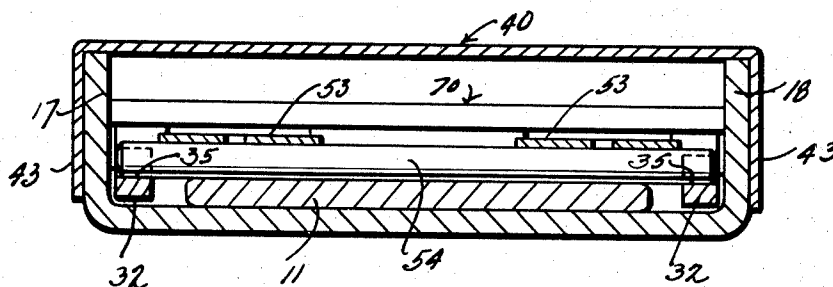


Fig. 6



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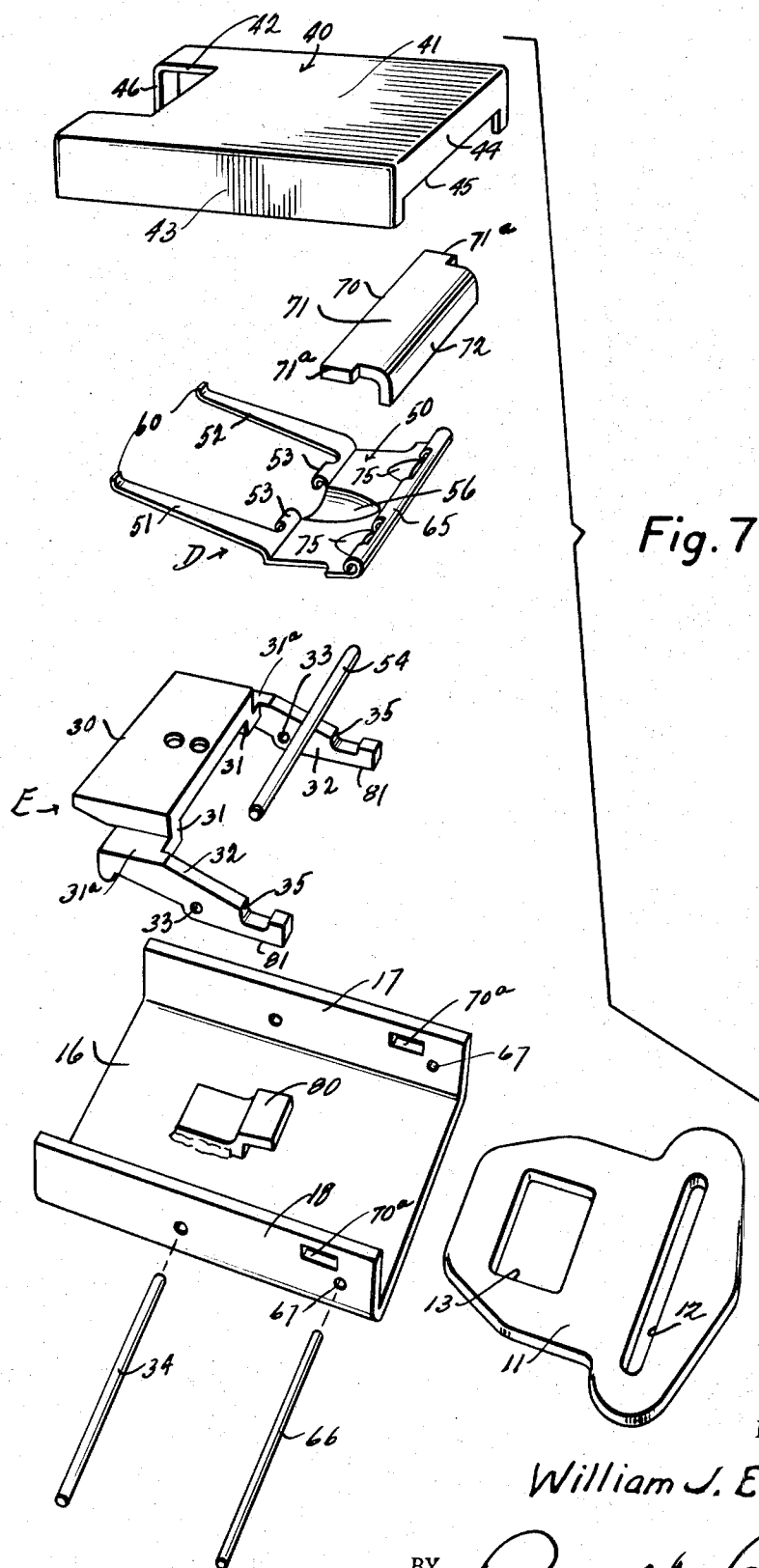


Fig. 7

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SPRING LATCHING SAFETY BELT PUSH TYPE

This is a continuation application out of application Ser. No. 762,943, filed in the name of William J. Eubank on Sept. 26, 1968 now abandoned.

This invention relates to a safety belt buckle construction.

The primary object of this invention is the provision of a compact and durable safety belt buckle which can be economically fabricated, and the parts of which are so associated that there is little chance of failure of parts to properly function. In this connection the buckle consists primarily of a casing structure having operating mechanism movably associated herewith and including a latching dog with integral spring means durably and compactly associated with each other.

A further object of this invention is the provision of an improved buckle having a pivoted type of push button with improved lifting means and a novel integrally associated latching dog and spring biasing means.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawings forming part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views.

FIG. 1 is a plan view of the improved buckle, showing in dot-and-dash lines the belt connections thereof.

FIG. 2 is a plan view of the buckle assembly with the cover removed and exposing the operating parts.

FIG. 3 is an enlarged lengthwise cross sectional view taken substantially on line 3—3 of FIG. 2, showing the free operating position of the buckle with the belt tongue in locked position thereon.

FIG. 4 is a cross sectional view of parts as shown in FIG. 3, but showing the operated position of a push button in order to enable detachment of the belt tongue from the buckle.

FIGS. 5 and 6 are transverse cross sectional views taken substantially on the lines 5—5 and 6—6 shown in FIG. 2.

FIG. 7 is an exploded perspective view of the individual parts of the buckle assembly.

In the drawings wherein for the purpose of illustration is shown only a preferred embodiment of the invention, the letter A may generally designate the improved buckle. A flexible belt B as shown in dot-and-dash lines in FIG. 1 is associated in conventional manner with the buckle. The buckle includes the casing structure C, latching means D and actuating means E.

The casing C preferably includes a body portion 10 of stamped metal including a base wall 16 and right angled upstanding spaced side walls 17 and 18. The base wall 16 may be provided with an opening 19 therein for receiving an end of the belt structure B. If desired, in lieu of this opening 19, means may be provided in the casing (not shown) for adjustable attachment of an end of the belt, such as the means shown in U.S. Pat. No. 3,349,445. The flexible belt B at one end has attached thereto a tongue plate 11 of usual construction, including a belt receiving slot 12 and an opening 13 to receive a latching dog or detent mechanism of the buckle to be subsequently described.

The latching means D and the actuating means E therefore are of novel construction. The actuating means E is of lever type construction, including a

horizontally positioned push button plate 30 having depending side flanges or legs 31. The lower portions of legs 31 are laterally side extended and provided with lifting arms 32, which are parallel and extend forwardly, as shown in FIG. 7; each of the arms having an opening 33 therein for receiving a horizontal pivot pin 34, the ends of which are pivotally mounted in the side walls 17 and 18 of the casing C. This pin 34 is located intermediate the ends of the arms 32, with the push button plate 30 lying at the rear end of the buckle. The forward ends of the arms 32 are provided with elongated recesses or slots 35 adapted to receive the ends of a latching dog pin to be subsequently described. In position in the chamber 36 of the casing C the lifting arms 32 lie closely adjacent to the inside surfaces of the walls 17 and 18, and the pin 34 lies spaced closely above the inside surface of the base wall 16.

The casing body 10 is preferably provided with a cover 40 having a top wall 41 provided with a rear opening 42 therein. It is also provided with depending sidewalls 43. A front wall 44 is provided, terminating at its bottom edge short of the lower edges of the side walls 43 to provide a tongue inserting opening 45. The rear of the cover 40 is provided with narrow and relatively spaced depending rear wall sections 46. Thus, the opening 42 is exposed at the top of the cover and also at the rear thereof.

The cover 40 frictionally fits over the side walls 17 and 18 of the casing body. Other means may be provided to hold it in place, if so desired.

In the casing C, in latching position of the parts, the push button plate 30 lies slightly below the top surface of the cover well 41 and is exposed in said opening 42 so that with a finger the operator can easily depress the push button lever for lifting the latching dog.

Referring to the latching means D, the same includes a latching dog portion 50 having parallel rearwardly extending spring arms 51 and 52 integrally connected thereto. These parts are all made from a single piece of resilient spring metal, which is sufficiently still to provide a rigid latching dog portion 50 and arms 51 and 52 which can be flexed or resiliently moved vertically. The juncture of the latching dog portion 50 and the arms 51 and 52 is provided with integral barrel type portions 53 adapted to receive in the passageways thereof a vertically moveable horizontal bar or pin 54, the ends of which are adapted to rest in the slots or recesses 35 of the lifting arms 32. The latching dog portion 50 is provided with a depresses dimple type detent 56 very close to the barrels 53. The lower surface 56^a of the detent 56 slopes rearwardly and downwardly in facing relation with the tongue inserting opening 45. The detent 56 is for latching in the opening 13 of the belt tongue 11. The detent 56 of course slopes downwardly and to the rear, and lies below the level of the moveable pin 54 when the buckle parts are in free position, as shown in FIG. 3.

The relatively long flexible spring arms 51 and 52 extend rearwardly closely adjacent to and at the insides of the push button lifting arms 32. Their rear ends may be curved upwardly as at 60, if so desired. These spring arms, at their rear ends, engage under the lateral extensions 31^a of the legs 31. They are tensioned for resiliently urging the push button buckle to the free push position shown in FIG. 3. In order to prevent lift-

ing of the front end of the latching dog portion 50, the same is roiled, as shown at 65, and receives a pin 66 the ends of which pivotally bear in the openings 67 of the side walls 17 and 18. Furthermore, a member 70 may be provided at the pivoting end of the latch dog including a top horizontal portion 71 and a rear depending portion 72 the juncture of which forms a recess for receiving the rolled fore end of the latching dog, as shown in FIG. 3. The ends 71^a of the member 70 are socketed in openings 70^a of the wells 17 and 18.

The sheet metal latching dog portion 50 may be reinforced by upward crimping at 75 close to the roll 65, as will be noted in FIGS. 3 and 7.

A stop member 80 may be welded to the inside of the bottom well 16 as shown in FIG. 7 to limit the inserted movement of the belt tongue 11, as will be noted from FIGS. 3 and 7.

The operation of the improved buckle will be apparent from the foregoing. The easily accessible and firmly held push button plate 30 is normally urged into the position shown in FIG. 3 by the leaf type spring arms 51 and 52 holding the plate upwardly to its maximum position since at the time the forward ends of the arm portions 32 indicated at 81 in FIG. 3 will engage the inside surface of the base plate 16.

It will be noted from FIG. 2 that the ends of pin 54 lie loosely in the slots 35 of the arms 32 so that as the push button plate 30 is depressed to the position shown in FIG. 4, the pin 54 will ride along the slots 35 since the pin 54 is floating in the slots. The axis of pin 34 of the arms 32 is fixed on the casing side walls. The flexing of the spring arm 52 is shown in FIG. 4. In this position the detent dimple 56 has been raised to enable release of the belt tongue 11.

It will be noted from the construction of the combination latching dog 50 and the biasing spring arms 51 and 52 that such can withstand unusually large belt forces and at the same time the dog can be resiliently swung to non-latching position with facility by the operating means.

Various changes in the shape, size and arrangement of parts may be made to the form of the invention here shown and described, without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a safety belt buckle construction the combination of a casing having a base wall, upstanding laterally spaced side walls, a cover for the casing having a top opening therein, said base and side walls and cover defining a chamber, a lever movably mounted on the casing within the chamber comprising a pair of spaced lifting arms which are pivoted intermediate their ends to the side walls, said lifting arms at their ends having a rigidly connected push button plate rearwardly spaced from the pivot axis of the lifting arms and the forward ends of said arms forwardly of said pivot axis each having a longitudinally extending elongated slot therein, a latching member having a front latching dog portion and rigidly attached rearwardly extending spaced spring arms, said spring arms and latching member adjacent their attachment location having lateral projection means lying within the arm slots for free horizontal floating action therein fore and aft and for vertical

movement together with the fore ends of the lifting arms, said spring arms having resiliency normally biasing the push button plate toward the opening of the cover for finger depression, the latching dog having a rearwardly and downwardly sloping detent between the lifting arms, said casing at the front having an opening for receiving an opening provided belt tongue, means pivoting the latching dog portion to the casing, the latching dog normally assuming a tongue latching position under biased influence of said spring arms.

2. The buckle as described in claim 1 in which means is provided on the casing to limit the insertion of a belt tongue into latching relation with said dog.

3. As an article of manufacture a combination latching dog and biasing spring means formed of sheet metal including a rigid latching dog having a depressed latching dimple portion at its rear end and at each side of said dimple being provided with closely adjacent reinforcing devices for pivoting the latching dog, and elongated flexible and resilient biasing spring arms integrally connected to said latching dog extending rearwardly from the dimple end of the dog.

4. In a safety belt buckle construction the combination of a casing having a chamber therein, an operating device movably mounted on the casing, a latching dog movably mounted at its front end to the casing for vertical movement at its rear end within the chamber, its rear end having belt tongue latching means thereon, spring means connected at the rear end of the latching dog extending rearwardly of said latching means normally biased to urge said operating device to an upward neutral operating position and normally biased to also urge the rear latching means of said latching dog to a downward belt tongue latching position, said casing having an opening therein to receive a belt tongue therein to be engaged by and held in the chamber by said latching means when the dog is in normal latching position.

5. The safety belt buckle construction as defined in claim 4 in which the spring means comprises a plurality of spaced leaf type flexible spring arms extending rearwardly from the latching dog and normally tensioned to urge the operating device to a neutral operative position and the dog to a tongue latching position.

6. In a safety belt buckle construction the combination of a casing having a chamber therein and a belt tongue opening to the chamber, a latching dog pivoted at its forward end upon the casing adjacent to said opening for vertical movement at its rear end in the casing, the rear end of the dog having a latching means for engaging a belt tongue, said latching dog forwardly beyond said latching means having rearwardly extending leaf type spring arm means, a push button member movably mounted upon said casing having a finger engaging member disposed rearwardly of the mounting thereof and forwardly of the said mounting having means for pivotally raising the rear end of the dog against further tensioning of said spring arm means to move the latching means to a tongue releasing position, the spring arm means being under tension at all times to position said push button finger engaging member to an inactive position and also normally urging said dog into a tongue latching position.

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