Jan. 16, 1968 R. B. LANGE ET AL 3,363,288

BOOT BUCKLE

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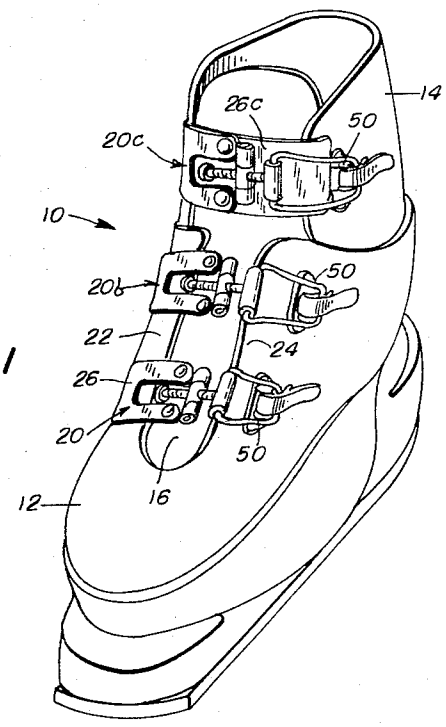


FIG. 1

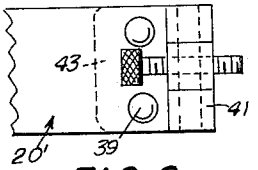


FIG. 8

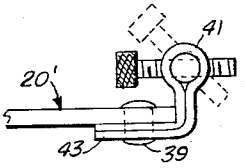


FIG. 9

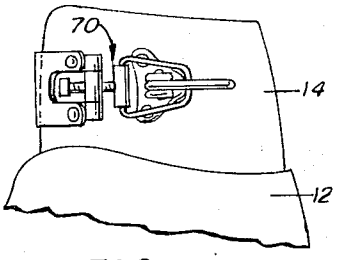


FIG. 7

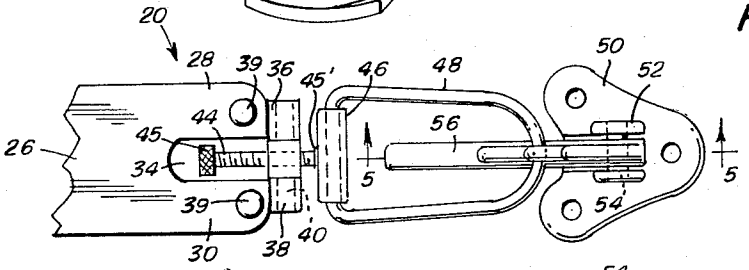


FIG. 2

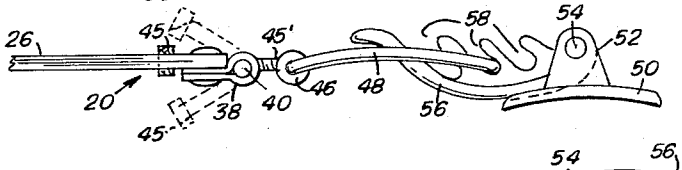


FIG. 3

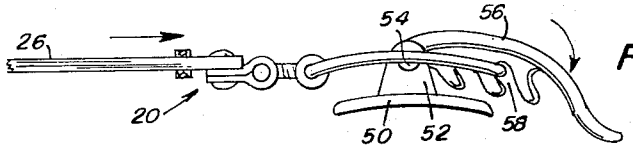


FIG. 4

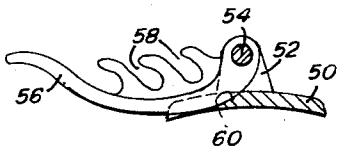


FIG. 5

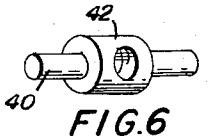


FIG. 6

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FIG. 10

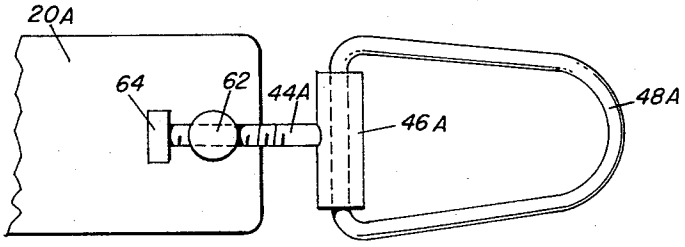


FIG. 11

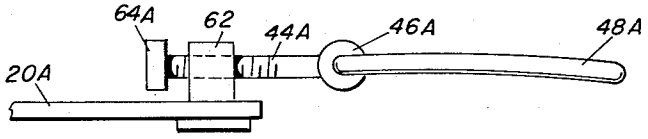


FIG. 12

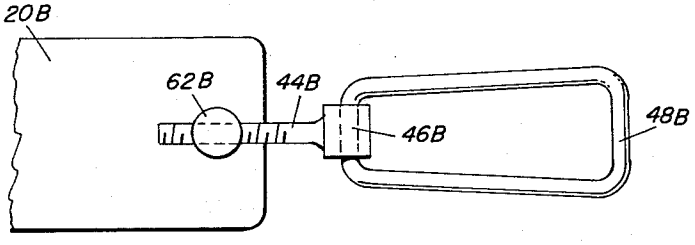


FIG. 13

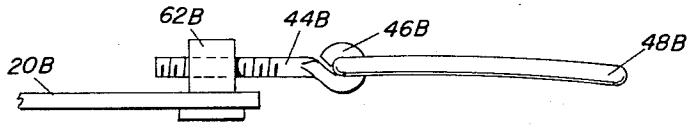


FIG. 14

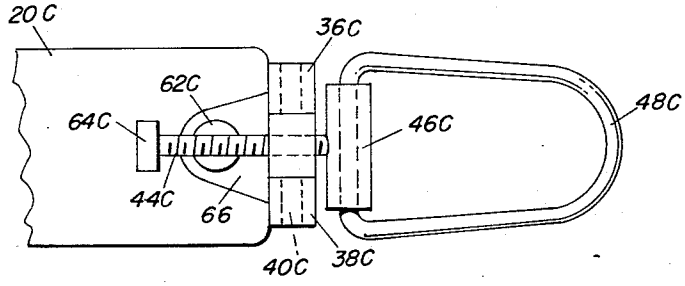
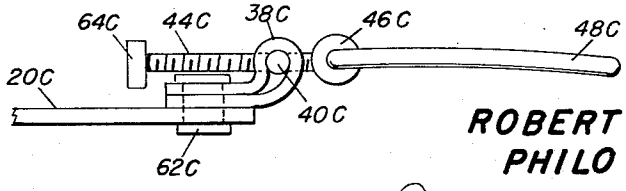


FIG. 15



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BOOT BUCKLE

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Continuation-in-part of application Ser. No. 380,184, July 3, 1964. This application Aug. 29, 1966, Ser. No. 582,783

11 Claims. (Cl. 24—68)

This invention relates to a buckle device for securing the flaps of ski and other type athletic boots and more particularly relates to a buckle having a fine degree of adjustability for varying the tightness of a boot for maximum skiing efficiency. This is a continuation-in-part of our co-pending application Ser. No. 380,184 filed July 3, 1964, and now abondoned.

In recent years, the use of quick connect and disconnect buckles for securing the flaps of ski boots has become increasingly popular. Such popularity results generally from the ease with which such a mechanism can be secured or loosened when wearing mittens or heavy gloves. In addition, buckles are more resistant to the effects of snow and ice coatings than are laces.

Due to the increasing use of long ski tows, chair lifts and other means for moving a skier to the top of the trail, it has become increasingly desirable to loosen one's boots while going up and have them tightened only when actually skiing. This procedure is necessitated by the fact that a wearer's foot has a tendency to become cold when inactive and the boot is secured tightly enough for efficient skiing.

The buckle device of this invention permits the wearer to readily loosen his boots when relaxing or traveling and quickly secure and tighten them when it is time to ski.

The buckles of the prior art are almost uniformly of the lever, snap-over type having a plurality of grooves along the lever for adjusting tightness. Because of the inability to obtain a fine adjustment, many skiers prefer the slightly too tight groove selection. Many times this causes an exceptional stress to be placed on the leather of the boot proper. It is a principal objective of this invention to provide a buckle having both a coarse and fine adjustment whereby a skier can select a degree and selection of tightness not available through conventional lacing or buckles of the prior art.

In boots of the type for which this invention finds its greatest usefulness, the flaps are relatively rigid and difficulties can occur if those elements on one flap are not accurately aligned with the elements mounted to the other flap. Another objective of this invention is to reduce these difficulties by making one set of elements pivotal with respect to the other.

These and other important objectives and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating a presently preferred embodiment thereof, and wherein:

FIGURE 1 is a front perspective view of a boot utilizing the invention;

FIGURE 2 is a top view of a buckle engaged but not secured;

FIGURE 3 is a side view of FIGURE 2;

FIGURE 4 is a view similar to FIGURE 3 showing the elements in their secured position;

FIGURE 5 is a cross-sectional view taken along the line 5—5 of FIGURE 2;

FIGURE 6 is a perspective of a shaft element;

FIGURE 7 is a partial side elevational view showing alternative buckle placement;

FIGURES 8 and 9 disclose a further embodiment of the invention;

FIGURES 10 and 11 illustrate another further objective of the invention;

FIGURES 12 and 13 illustrate another embodiment in accordance with the invention; and

FIGURES 14 and 15 illustrate yet another embodiment in accordance with the invention.

Referring now with more particularity to FIGURES 1 through 6 wherein like elements are indicated by like numerals, the boot of this invention is indicated by the numeral **10**. In the disclosed embodiment of this invention, the apparatus is applied to a plastic boot of a type more fully described in co-pending application Ser. No. 223,733, filed Sept. 14, 1962, continued in part in application Ser. No. 441,398, filed Feb. 24, 1965, now Patent No. 3,239,952.

The boot is comprised generally of a foot portion **12** and a pivoted gaiter **14**. The foot portion and gaiter are open along a front tongue section **16**. The opening **16** is conventionally drawn together about the foot and ankle of the wearer by laces or a series of buckles.

The buckling mechanisms of this invention are indicated generally by the numeral **20**. A plurality of the buckles **20** span the tongue opening **16**. In the embodiment described, three buckles are shown permitting them to be represented in a size easily viewed. It should be understood that any number sufficient to comfortably fasten the boot to the foot of the wearer can be used. It should also be understood that the buckle can be used with boots having overlapping flaps.

Since the buckles are identical, only the lowermost one shown will be described in detail. The tongue opening **16** is defined by a first flap **22** and a second flap **24**. Affixed to the first flap is a plastic strap **26** terminated by a pair of fingers **28** and **30** which define a recess **34** therebetween. A pair of bearing members **36** and **38** extend outwardly from the fingers and are secured to the fingers by way of the rivets **39**. A shaft **40** has its ends rotatably secured in bearings **36** and **38**. The shaft, as best seen in FIGURE 6, is enlarged intermediate its length at portion **42** and is formed with a transverse threaded aperture through the enlarged portion. A threaded rod **44** is received by the aperture. The rod has a knob end **45** receivable in recess **34** and a second end **45'** terminated by a housing **46**. The housing member is cylindrical and secures the base of a loop member **48** therein.

Secured to flap **24** and juxtaposed opposite strap **26** is a base member **50**. The base member **50** is formed with an up-standing yoke **52** which supports a pivot shaft **54** generally parallel to the longitudinal axis of shaft **40**. Pivotally secured to the yoke **52** by shaft **54** is a tensioning lever **56**, one side of which is formed with a plurality of loop-receiving notches **58**. The base member **50** is recessed at **60** to permit level **56** to assume a maximum counterclockwise swing as seen in FIGURE 5.

In operation, the wearer inserts his foot into the boot and begins sequentially securing the buckles, starting from the lowermost or that buckle nearest the toe. By trial and error, the correct degree of tightness can be determined by rotating shaft **44** by knob **45** until each loop is exactly at the correct distance from the supporting shaft to secure the flap members together when the tensioning lever has been moved to the position of FIGURE 4. Once the individual buckle adjustments are made, they should not require readjustment for some time. Naturally, when wearing different weight socks, etc., an adjustment can be made at any time. The shaft **40** can be pivoted to either of the dotted line positions (away from recess **34**) shown in FIGURE 2. This facilitates rotating the shaft via its knob **45**.

When a skier is ready to start a downhill course, he must merely reach down, place loops **48** into the selected notch **58** and snap lever **56** from the position shown in FIGURE 3 to that shown in FIGURE 4.

In many instances, skiers prefer that the strap span the distance between flaps rather than the buckle mechanism. A reference to the top buckle **20***c* illustrates this feature. A strap **26***c* is manufactured sufficiently long to span the opening and base member **50** is secured somewhat further away from the tongue opening. Good results have been obtained having all buckles arranged as **20** and **20***b*, all arranged as **20***c*, and the combination of buckles as seen in FIGURE 1.

If it is desired to increase the strength of strap **20** by eliminating the recess **34**, the embodiment shown in FIGURES 8 and 9 is utilized. In this embodiment the strap **20'** is full throughout its length. The bearing members are comprised of loop sections **41** extending above the plane of the strap and a shank portion **43** along the length of the strap and secured thereto by rivets **39'**. The raised loop elevates the rod **44** away from the strap while permitting it to swing to the dotted line position of FIGURE 9. The remaining structure is identical to that previously described.

The side elevation of FIGURE 7 represents the situation where the strap **20** or the first flap **22** extends across the tongue opening in overlapping relationship with the flap **24**. In this instance, the adjustable loop and the pivoting lever are carried over the second flap when the buckle **70** is secured. Of course, the embodiment of FIGURES 8 and 9 can be used with the buckle placement shown in FIGURE 7.

Due to the relative stiffness of the material from which a preferred embodiment of the ski boot is fabricated, it has been found desirable to incorporate a pivoted mounting in lieu of or in addition to the aforedescribed structure supporting the loop member **48**. The pivoted mounting provides a means to compensate for misalignment between corresponding elements mounted on opposing boot flaps. By reference to FIGURES 10 through 13, two such mountings are illustrated.

In the embodiment of FIGURES 10 and 11 a loop **48A** is connected to a base member or strap **20A** through a housing **46A** and a threaded rod **44A**. The rod **44A** is disposed through a transverse threaded aperture in a headed shaft or pin **62** rotatably mounted through an opening in the strap **20A**. The rod **44A** is provided, on the free end thereof, with a headed portion **64** which prevents the rod from being threaded out of the aperture in the shaft or pin **62**.

As can be readily seen, with the aforedescribed structure, the loop **48A** can be pivoted around the axis of the shaft or pin **62** thereby allowing lateral movement of the loop to compensate for misalignment between the loop and the corresponding structure on the opposite flap.

In the embodiment of FIGURES 12 and 13, a constructional variation of the structure of the embodiment of FIGURES 10 and 11 is illustrated. In this variation a loop **48B**, of somewhat a different plan form configuration, is connected to a base member or strap **20B** through a housing **46B** and threaded rod **44B**. The rod is disposed through a threaded aperture in a headed shaft or pin **62B** rotatably mounted through an opening in the strap **20B**. The function of the aforedescribed structure is identical to that of the embodiment of FIGURES 10 and 11, however, it will be noted that the constructional details are somewhat simplified in that the housing **46B** is formed of a flattened extension of the rod **44B**, rolled around the loop **48B** to provide a swiveling connection therewith. It should also be noted that the rod **44'''** is without a head on the free end thereof thereby permitting the rod to be threaded out of the aperture in the pin **62'''**. This latter feature provides the benefit of replacement of worn or damaged components by allowing the disassembly of the hoop, rod and pin structure if necessary from the strap.

In FIGURES 14 and 15 the swivel capability is added to the structure of the embodiments of FIGURES 1 through 9. In the embodiment illustrated in these figures, a loop **48C** is connected to a strap or base member **20C** through a housing **46C** and a threaded rod **44C**. The rod **44C** is disposed through a transverse threaded aperture in a shaft **40C** which, in turn, is rotatably held by bearings **36C** and **38C** mounted on a base **66**. The base **66** is pivotally connected to the strap **20C** by a headed pin or shaft **62C** fixedly connected thereto and rotatably mounted through an opening in the strap.

The aforedescribed structure thereby provides a swivel mounting for the loop **48C** which provides the advantages of the embodiments shown in FIGURES 1 through 9 and 10 through 13.

In a general manner, while there has been disclosed in the above description, what is deemed to be the most practical and efficient embodiment of the invention, it should be well understood that the invention is not limited to such an embodiment as there might be changes made in the arrangement, disposition, and form of the parts without departing from the principle of the present invention as comprehended within the scope of the accompanying claims.

We claim:

1. A fastening device for securing first and second flaps of a ski boot together comprising:
- a first base member fixedly secured to said first flap,
- a bearing carried by said member,
- a shaft rotatably received by said bearing,
- a securing loop,
- means rotatable with said shaft adjustably supporting said loop for movement toward and away from said shaft,
- a second base member secured to said second flap and juxtaposed opposite said first member,
- a loop-engaging lever pivotally secured to said second flap about an axis generally parallel to said shaft, said lever having a first position toward said shaft and a second position extending away from said shaft, said lever having a groove for receiving said loop when in said first position to thereby move said first flap with respect to said second flap when said lever is pivoted from said first position to said second position.

2. The device described in claim **1** wherein said means includes a threaded rod for supporting said loop and said shaft having a threaded opening transverse of its length to threadably receive said rod.

3. The device described in claim **2** wherein said lever has a plurality of loop engaging grooves along its length.

4. A fastening device for securing first and second flaps of a ski boot together comprising a first strap fixedly secured to said first flap,
- a base member secured to said second flap and juxtaposed opposite said first strap,
- a bearing carried by said strap nearest said base member,
- a shaft rotatably received by said bearing,
- a securing loop mounted on said shaft,
- means rotatable with respect to said shaft and adjustably supporting said loop for movement toward and away from said shaft,
- a loop-engaging lever pivotally secured to said second flap about an axis generaly parallel to said shaft, said lever having a first position toward said shaft and a second position away from said shaft, said lever having a groove for receiving said loop when in said first position to thereby move said first flap with respect to said second flap when said lever is pivoted from said first position to said second position.

5. A fastening device for securing first and second flaps of an athletic boot together comprising:
- a strap fixedly secured to said first flap,
- a base member secured to said second flap and juxta-

posed opposite said strap, said strap at that end closest to said base member terminated by a pair of extensions defining a recess longitudinal of strap length,

a bearing carried at the end of said extension carried by said member,

a shaft having its ends received by said bearings,

an enlarged collar intermediate the ends of said shaft having a threaded aperture transverse of shaft length, a threaded shaft received by said aperture and having a first end received in said recess,

a securing loop fixed to the other end of said shaft whereby the shaft's position with respect to said collar can be varied by rotating said loop,

a loop-engaging lever pivotally secured to said second flap about an axis generally parallel to said shaft, said lever having a first position toward said shaft and a second position extending away from said shaft, said lever having a groove for receiving said loop when in said first position to thereby move said first flap with respect to said second flap when said lever is pivoted from said first position to said second position.

6. A fastening device for securing first and second flaps of a boot together comprising:

a securing loop,

supporting means swivelly mounting said securing loop to said first flap,

said supporting means including an adjustment means for movement of said securing loop toward and away from said first flap,

a loop-engaging lever pivotally secured to said second flap about an axis generally parallel to the surface of said second flap, said lever having a first position toward said shaft and a second position extending away from said shaft, said lever having at least one groove for receiving said loop when in said first position to thereby move said first flap with respect to said second flap when said lever is pivoted from said first position to said second position.

7. A fastening device in accordance with claim 6 wherein said supporting means comprises a first base mounted

on said first flap and a shaft rotatably carried by said member.

8. A fastening device in accordance with claim 7 wherein said adjustment means includes a threaded rod for supporting said loop and said shaft having a threaded opening transverse of its length to threadably receive said rod.

9. A device in accordance with claim 8 wherein said shaft is generally perpendicular to said first flap and disposed through said member for rotation therein.

10. A device in accordance with claim 6 wherein said supporting means comprises:

a first base mounted on said flap,

a first shaft disposed generally perpendicular through said first base for rotation therein,

a second base fixed to said first shaft,

a bearing carried by said second base,

a second shaft disposed substantially perpendicular to said first shaft rotatably received in said bearing,

said adjustment means supporting said loop for movement toward and away from said shaft.

11. A fastening device in accordance with claim 10 wherein said adjustment means includes a threaded rod for supporting said loop and said second shaft having a threaded opening transverse of its length to threadably receive said rod.

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